C21.5:1059/3 Engin

Vol. 1059 Number 3

260

OFFICIAL GAZETTE

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UNITED STATES PATENT AND TRADEMARK OFFICE

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October 15, 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

October 15, 1985 Volume 1059 Number 3

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Oct. 12, 1985 and is announced in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

International PCT fees have been changed effective Oct. 29, 1985 and were announced in the *PCT Gazette* on Aug. 29, 1985 and in the *Official Gazette* at 1058 O.G. 26 on Sept. 24, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee:	
if paid before Oct. 5, 1985	$ 125.00
if paid on or after Oct. 7, 1985	170.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed:	
if paid before Oct. 5, 1985	500.00
if paid on or after Oct. 7, 1985	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before Oct. 12, 1985	680.00
if paid on or after Oct. 15, 1985	750.00
International fees	
Basic fee (first 30 pages):	
if paid before Oct. 29, 1985	230.00
if paid on or after Oct. 29, 1985	280.00
Basic Supplemental fee (for each page over 30):	
if paid before Oct. 29, 1985	4.00
if paid on or after Oct. 29, 1985	6.00
Designation fee (for the first 10 national or regional offices):	
if paid before Oct. 29, 1985	55.00
if paid on or after Oct. 29, 1985	70.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Aug. 28, 1985.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Oct. 12, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,353,133 through 4,354,278
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges, as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98-622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,434,918, Re. S.N. 755,300, Filed July 15, 1985, Cl. 223/075, BOARDING APPARATUS AND METHOD, Michael J. Hodges, Owner of Record: *Detexomat Machinery Ltd., Buckinghamshire, England,* Attorney or Agent: Julian W. Dority, et al., Ex. Gp.: 247

4,454,945, Re. S.N. 765,751, Filed Aug. 15, 1985, Cl. 206/524.3, MULTIWALL CONTAINER, Saleh A. Jabarin, et al., Owner of Record: *Owens-Illinois, Inc., Toledo, Ohio,* Attorney or Agent: Philip M. Rice, et al., Ex. Gp.: 241

4,506,138, Re. S.N. 753,453, Filed July 9, 1985, Cl. 219/205, MAGNETICALLY ATTACHABLE ELECTRIC PREHEATER FOR AUTOMOBILE ENGINES, James W. Bennett, et al., Owner of Record: *Future Tech, Inc., Mankato, Minn.,* Attorney or Agent: Harold J. Kinney, et al., Ex. Gp.: 213

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,575,871, Reexam. No. 90/000,851, Requested: Sept. 9, 1985, Cl. 252/87, TETRAARYL ARYLAMINIUM SALTS AND USE AS INFRARED ABSORBERS, Peter V. Susi, et al., Owner of Record: *American Cyanamid Co., Stamford, Conn.,* Attorney or Agent: Gordon L. Hart, Ex. Gp.: 150, Requester: Owner

3,855,956, Reexam. No. 90/000,852, Requested: Sept. 6, 1985, Cl. 112/453, SEWING MACHINE STITCH PATTERN GENERATION FROM STITCH DATA STORED IN STATIC MEMORY, John W. Wurst, Owner of Record: *The Singer Co., New York, N.Y.,* Attorney or Agent: Marshall J. Breen, Ex. Gp.: 247, Requester: Husqvarna Aktiebolag, Greenwich, Conn.

3,953,394, Reexam. No. 90/000,860, Requested: Sept. 18, 1985, Cl. 524/86, POLYESTER ALLOYS AND MOLDING COMPOSITIONS CONTAINING THE SAME, Daniel W. Fox, et al., Owner of Record: *General Electric Co., Pittsfield, Mass.,* Attorney or Agent: William F. Kilgannon, Ex. Gp.: 153, Requester: Neuman, Williams, et al., Chicago, Ill.

4,078,564, Reexam. No. 90/000,853, Requested: Sept. 11, 1985, Cl. 128/216, INTRALENTICULAR CATARACT SURGERY, Joseph Spina, et al., Owner of Record: *Inventors,* Attorney or Agent: Fidelman, Wolffe, et al., Ex. Gp.: 330, Requester: Bernard, Rothwell, et al., Washington, D.C.

4,113,281, Reexam. No. 90/000,857, Requested: Sept. 17, 1985, Cl. 282/11.5A, CONTINUOUS BUSINESS FORMS ASSEMBLY, Per W. Halse, Owner of Record: *Moore Business Forms, Inc., Niagara Falls, N.Y.,* Attorney or Agent: Cushman, Darby, et al., Ex. Gp.: 320, Requester: Owner

4,168,851, Reexam. No. 90/000,859, Requested: Sept. 17, 1985, Cl. 282/11.5A, CONTINUOUS BUSINESS FORMS ASSEMBLY, Per W. Halse, Owner of Record: *Moore Business Forms, Inc., Niagara Falls, N.Y.,* Attorney or Agent: Cushman, Darby, et al., Ex. Gp.: 320, Requester: Owner

4,485,759, Reexam. No. 90/000,854, Requested: Sept. 13, 1985, Cl. 118/503, PLANETARY SUBSTRATE SUPPORT APPARATUS FOR VAPOR VACUUM DEPOSITION COATING, Henry E. Brandolf, Owner of Record: *Multi-Arc Vacuum System, Inc., St. Paul, Minn.,* Attorney or Agent: Merchant, Gould, et al., Ex. Gp.: 152, Requester: Charles B. Spencer, New York, N.Y.

4,513,117, Reexam. No. 90/000,855, Requested: Sept. 16, 1985, Cl. 525/60, PROCESS FOR CONVERSION OF VINYL COPOLYMERS TO VINYLIC ALCOHOL COPOLYMERS BY HOMOGENEOUS REACTION WITH ORGANOMETALLIC COMPOUNDS, Richard W. Fries, Owner of Record: *Northern Petrochemical Co., Omaha, Nebr.,* Attorney or Agent: Donald F. Haas, Ex. Gp.: 150, Requester: Owner

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of any of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before Nov. 18, 1985:

Andrade, John C., 712 Cheltenham Rd., Wilmington, Del. 19808.
Fogel, Laurence D., 73 Stoneleigh Rd., Trumbull, Conn. 06611.
Forlenza, Gerald M., 6401 Rockhurst Rd., Bethesda, Md. 20817.
Hunter, James M., 5911 Edsall Rd., PH-12, Alexandria, Va. 22304.
Kuller, Mark D., 2122 Mass. Ave., N.W., Washington, D.C. 20008.
Linck, Nancy J., 130 Park Dr., Westfield, Mass. 01085.
Parrish, John A., 4640 N. Plainfield, Norridge, Ill. 60656.
Rossi, Marc A., 106 Tamarack Ct., Sterling, Va. 22170.
Shlaes, Carole, 1466 Charles, St. Paul, Minn. 55104.
Skiff, Peter K., 3114 Maries Dr., Falls Church, Va. 22041.

CAMERON WEIFFENBACH,
Sept. 19, 1985. *Director Office of Enrollment and Discipline.*

Expedited Procedure for Processing Amendments and Other Responses After Final Rejection (37 CFR 1.116)

In an effort to improve the timeliness of the processing of amendments and other responses under 37 CFR 1.116, and thereby provide better service to the public, the Patent and Trademark Office (PTO) is establishing, effective immediately, an expedited processing procedure which the public may utilize in filing amendments and other responses after final rejection under 37 CFR 1.116. In order for an applicant to take advantage of the expedited procedure the amendment or other response under 37 CFR 1.116 will have to be marked as a "Response Under 37 CFR 1.116 — Expedited Procedure-Examining Group (Insert Examining Group Number)" on the upper right portion of the amendment or other response and the envelope must be marked "Box AF" in the lower left hand corner. The markings preferably should be written in a bright color with a felt point marker. If the response is mailed to the Office, the envelope should contain only responses under 37 CFR 1.116 and should be mailed to "Box AF, Commissioner of Pa-

tents and Trademarks, Washington, D.C. 20231." Instead of mailing the envelope to "Box AF" as noted above, the response may be hand-carried to the particular Examining Group or other area of the Office in which the application is pending and marked on the outside envelope "Response Under 37 CFR 1.116 — Expedited Procedure-Examining Group (Insert Examining Group Number)".

Upon receipt by the PTO from the Postal Service of an envelope appropriately marked "Box AF," the envelope will be specially processed by the PTO Mail Room and forwarded promptly to the Examining Group, via the Office of Finance if any fees have to be charged or otherwise processed. Upon receipt of the response in the Examining Group it will be promptly processed by a designated clerical employee and forwarded to the examiner, via the Supervisory Primary Examiner (SPE), for action. The SPE is responsible for ensuring that prompt action on the response is taken by the examiner. If the examiner to which the application is assigned is not available and will not be available for an extended period, the SPE will ensure that action on the application is promptly taken to assure meeting the PTO goal described below. Once the examiner has completed his or her consideration of the response, the examiner's action will be promptly typed and mailed by clerical employees designated to expedite the processing of responses filed under this procedure. The Examining Group supervisory personnel, e.g., the Supervisory Primary Examiners, Supervisory Applications Clerk, and Group Director are responsible for ensuring that actions on responses filed under this procedure are promptly processed and mailed.

The PTO goal is to mail the examiner's action on the response within one month from the date on which the amendment or response is received by the PTO. The PTO is establishing monitoring procedures to determine how well the goal is being achieved. If the goal of mailing the action on the response within one month or less is not achieved in a high percentage of applications, e.g., at least 90–95% of appropriately marked responses, after a reasonable trial period, the PTO will institute further changes in procedures in the future which will give appropriate relief to applicants in cases where the delay is due to Office processing.

Applicants are encouraged to utilize this expedited procedure in order to facilitate PTO processing of responses under 37 CFR 1.116. If applicants do not utilize the procedure by appropriately marking the envelope and enclosed papers, the benefits expected to be achieved therefrom will not be attained. The procedure cannot be expected to result in achievement of the goal in applications in which the delay results from actions by the applicant, e.g., delayed interviews, applicant's desire to file a further response, or a petition by applicant which requires a decision and delays action on the response. In any application in which a response under this procedure has been filed and no action by the examiner has been received within the time referred to herein, plus normal mailing time, a telephone call to the SPE of the relevant Group Art Unit would be appropriate in order to permit the SPE to determine the cause for any delay. If the SPE is unavailable or if no satisfactory response is received, the Group Director of the Examining Group should be contacted.

Any comments on this expedited procedure during the trial period are invited and should be directed to the attention of Rene D. Tegtmeyer, Assistant Commissioner for Patents, U.S. Patent and Trademark Office, Washington, D.C. 20231.

Sept. 20, 1985.

DONALD J. QUIGG,
Commissioner of Patents and Trademarks — Designate.

PATENT NOTICES

Certificates of Correction for the Week of Oct. 15, 1985

Re. 31,896	4,481,474	4,507,935	4,518,891
Re. 31,944	4,481,967	4,508,020	4,519,103
D. 276,633	4,482,339	4,508,281	4,519,253
D. 278,275	4,482,487	4,508,690	4,519,360
D. 278,538	4,483,367	4,508,771	4,519,526
D. 278,958	4,484,980	4,508,833	4,519,865
3,918,195	4,485,389	4,508,840	4,519,926
4,306,003	4,485,449	4,508,943	4,519,994
4,325,855	4,485,762	4,509,369	4,520,046
4,341,188	4,486,248	4,509,396	4,520,253
4,375,636	4,486,522	4,509,474	4,520,398
4,377,904	4,486,578	4,509,563	4,520,413
4,395,830	4,487,921	4,509,829	4,520,532
4,397,004	4,488,900	4,509,951	4,520,697
4,399,065	4,489,459	4,510,108	4,520,860
4,399,299	4,489,686	4,510,259	4,520,951
4,400,299	4,489,729	4,510,268	4,521,160
4,405,101	4,490,545	4,510,537	4,521,214
4,407,751	4,490,786	4,510,717	4,521,341
4,410,332	4,491,304	4,510,812	4,521,412
4,416,398	4,491,478	4,510,887	4,521,420
4,418,068	4,491,483	4,510,910	4,521,543
4,421,817	4,491,829	4,511,125	4,522,104
4,421,934	4,491,922	4,511,219	4,522,163
4,426,513	4,492,272	4,511,288	4,522,234
4,429,001	4,492,522	4,511,400	4,522,274
4,430,391	4,492,696	4,511,401	4,522,639
4,431,033	4,492,710	4,511,440	4,522,671
4,431,561	4,492,753	4,511,638	4,522,672
4,431,581	4,493,038	4,512,037	4,522,812
4,432,311	4,493,056	4,512,059	4,522,911
4,435,754	4,494,054	4,512,154	4,523,073
4,438,258	4,495,400	4,512,882	4,523,302
4,439,106	4,495,683	4,513,075	4,523,312
4,439,391	4,496,521	4,513,098	4,523,443
4,439,425	4,496,717	4,513,302	4,523,503
4,442,238	4,496,842	4,513,522	4,523,619
4,443,206	4,497,184	4,513,891	4,523,679
4,444,878	4,498,055	4,514,090	4,523,783
4,446,419	4,498,241	4,514,484	4,524,616
4,451,077	4,499,292	4,514,611	4,524,681
4,453,807	4,499,621	4,514,778	4,524,686
4,458,069	4,499,820	4,515,302	4,524,737
4,458,745	4,500,002	4,515,598	4,524,980
4,460,315	4,500,056	4,515,806	4,524,988
4,461,063	4,500,093	4,515,904	4,525,044
4,462,269	4,500,143	4,516,281	4,525,096
4,464,528	4,500,701	4,516,647	4,525,303
4,467,821	4,500,844	4,516,748	4,525,375
4,468,650	4,501,593	4,516,782	4,525,379
4,468,793	4,501,880	4,516,839	4,525,469
4,469,704	4,502,397	4,516,850	4,525,477
4,471,040	4,503,212	4,517,030	4,525,497
4,472,354	4,503,311	4,517,089	4,525,705
4,472,746	4,503,373	4,517,099	4,525,746
4,472,770	4,503,788	4,517,150	4,525,921
4,474,259	4,504,174	4,517,181	4,525,922
4,474,731	4,504,310	4,517,209	4,526,054
4,474,791	4,504,366	4,517,343	4,526,161
4,475,065	4,504,772	4,517,366	4,526,243
4,476,911	4,504,978	4,517,609	4,526,244
4,478,185	4,505,496	4,517,616	4,526,286
4,478,194	4,505,921	4,517,619	4,526,375
4,478,510	4,505,929	4,517,640	4,526,430
4,479,338	4,505,995	4,517,664	4,526,615
4,479,906	4,507,077	4,517,931	4,526,679
4,480,318	4,507,168	4,518,647	4,526,686
4,480,909	4,507,385	4,518,709	4,526,793
4,481,315	4,507,678	4,518,812	4,526,807
4,526,821	4,528,146	4,530,234	4,532,095
4,526,834	4,528,228	4,530,787	4,532,345
4,526,918	4,528,377	4,530,859	4,532,362
4,527,018	4,528,836	4,530,879	4,532,403
4,527,108	4,529,289	4,531,049	4,533,286
4,527,243	4,529,401	4,531,478	4,533,566
4,527,394	4,529,428	4,531,660	4,536,454
4,527,662	4,529,766	4,531,694	4,536,179
4,527,787	4,529,772	4,531,848	4,536,236
4,527,894	4,530,055	4,531,997	4,536,298
4,527,952	4,530,176	4,532,089	

Disclaimers

3,818,009.—*Harold M. Taylor, James D. Davenport* and *Ronald E. Hackler,* Indianapolis, Ind. ALPHA, ALPHA-DISUBSTITUTED-5-PYRIMIDINEMETHANES. Patent dated June 18, 1974. Disclaimer filed Aug. 14, 1985, by the assignee, *Eli Lilly and Co.*

Hereby enters this disclaimer to claims 1–3, 5–17, 19–23, 25–28, 30–31, 33, 35, 38–39, 42–43 and 45 of said patent.

3,854,321.—*Barton E. Dahneke,* Palmyra, N.Y. AEROSOL BEAM DEVICE AND METHOD. Patent dated Dec. 17, 1974. Disclaimer filed Aug. 5, 1985, by the *inventor.*

Hereby enters this disclaimer to claims 1, 8 and 9 of said patent.

3,868,244.—*Harold' M. Taylor* and *James D. Davenport,* Indianapolis, and *Ronald E. Hackler,* Greenfield, Ind. PLANT GROWTH REGULATION. Patent dated Feb. 25, 1975. Disclaimer filed Aug. 14, 1985, by the assignee, *Eli Lilly and Co.*

Hereby enters this disclaimer to claims 1–7 and 10–29 of said patent.

3,887,708.—*Harold M. Taylor, James D. Davenport* and *Ronald E. Hackler,* Indianapolis, Ind. ALPHA, ALPHA-DISUBSTITUTED-5-PYRIMIDINEMETHANES USED AS FUNGICIDES. Patent dated June 3, 1975. Disclaimer filed Aug. 14, 1985, by the assignee, *Eli Lilly and Co.*

Hereby enters this disclaimer to claims 1–3 and 6–10 of said patent.

4,093,911.—*Howard D. W. Hill,* Cupertino and *John R. Laudermilch,* Foster City, Calif. NUCLEAR MAGNETIC RESONANCE SPECTROMETER EMPLOYING AN IMPROVED RESONANCE SIGNAL GATING CIRCUIT. Patent dated June 6, 1978. Disclaimer filed Aug. 23, 1985, by the assignee, *Varian Associates, Inc.*

Hereby enters this disclaimer to claims 1 through 3 of said patent.

4,147,791.—*Werner Meiser, Karl Heinz Buchel* and *Wolfgang Kramer,* Wuppertal and *Ferdinand Grewe,*

Burscheid, Germany. 1-SUBSTITUTED-1,2,4-TRIAZOLE FUNGICIDAL COMPOSITIONS THAT METHODS FOR COMBATTING FUNGI THAT INFECT OR ATTACK PLANTS. Patent dated Apr. 3, 1979. Disclaimer filed Aug. 5, 1985, by the assignee, *Bayer Aktiengesellschaft.*

The term of this patent subsequent to Oct. 14, 1992, has been disclaimed.

4,247,208.—*Bennie C. Fulkerson* and Michael A. Smith, Slidell, La. ELECTRICAL STENOGRAPHIC MACHINE. Patent dated Jan. 27, 1981. Disclaimer filed Aug. 21, 1985, by the assignee, *Stenograph Corp.*

Hereby enters this disclaimer to claims 3, 7 and 13 of said patent.

4,408,036.—*Reinoud J. Gaymans,* Enschede and *Edmond H. J. P. Bour,* Limbricht, Netherlands. PREPARATION OF POLYTETRAMETHYLENE ADIPAMIDE. Patent dated Oct. 4, 1983. Disclaimer filed Aug. 5, 1985, by the assignee, *Stamicarbon, B. V.*

Hereby enters this disclaimer to the entire remaining term of said patent.

4,460,762.—*Reinoud Gaymans,* Enschede and *Edmond H. J. P. Bour,* Limbricht, Netherlands. PREPARATION OF HIGH MOLECULAR POLYTETRAMETHYLENE ADIPAMIDE. Patent dated July 17, 1984. Disclaimer filed Aug. 5, 1985, by the assignee, *Stamicarbon, B. V.*

Hereby enters this disclaimer to the entire remaining term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

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	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
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Colorado	Denver Public Library	(303) 571-2122
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	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
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	Boston Public Library	(617) 536-5400 Ext. 265
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	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF August 31, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	12-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-12-84
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	11-30-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	9-26-83
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	3-21-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-27-82
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—E. E. KUBASIEWICZ, Director	11-29-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	2-22-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	5-16-83
DESIGN, GROUP 290—K. L. CAGE, Director	3-07-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	7-12-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	8-29-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-10-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	4-15-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-02-84

Expiration of patents: The patents within the range of numbers indicated below expire during July 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,395,406 to 3,399,405, inclusive

Plant Patents ..... Numbers 2,825 to 2,829 inclusive

REISSUES

OCTOBER 15, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

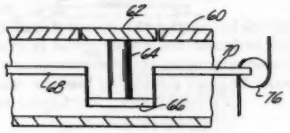
Re. 32,002
CONSTANT MOMENT WEIGH SCALE WITH FLOATING FLEXURE BEAM

Ralph S. Shoberg, 6176 Briggs Lake Dr., Brighton, Mich. 48116, and Thomas A. Ulicny, 518 W. Woodland, Ferndale, Mich. 48220

Original No. 3,938,603, dated Feb. 17, 1976, Ser. No. 537,090, Dec. 30, 1974. Division of Ser. No. 537,090, Dec. 30, 1974, Pat. No. 3,938,603. Application for reissue Jun. 25, 1979, Ser. No. 52,077

Int. Cl.[4] G01G *3/14*

U.S. Cl. 177—24 **2 Claims**



19. Floating beam weigh scale apparatus comprising:
a base, load receiving means spaced from the base, first and second pivot members disposed between the base and load receiving means, load transmitting means interconnecting the pivots, the base, and the load receiving means to produce moments in the pivots of opposite sense and about spaced axes, a substantially rigid beam connected to and extending between the pivots, means carried by the beam for producing a signal related to the bending stress therein over the elastic bending range thereof, lever arms connected to the pivots and extending longitudinally of the scale and perpendicular to the pivots, and means interconnecting at least a portion of the load receiving means to the lever arms for multiplying the turning moment applied to the pivots by the load applied to the load receiving means.

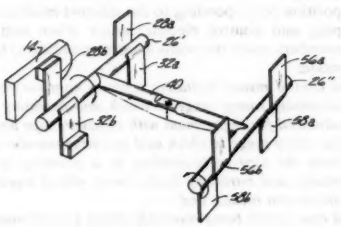
Re. 32,003
CONSTANT MOMENT WEIGH SCALE WITH FLOATING FLEXURE BEAM

Ralph S. Shoberg, 6176 Briggs Lake Dr., Brighton, Mich. 48116

Original No. 3,938,603, dated Feb. 17, 1976, Ser. No. 537,090, Dec. 30, 1974. Division of Ser. No. 537,090, Dec. 30, 1974, Pat. No. 3,938,603. Application for reissue Jun. 25, 1979, Ser. No. 52,078

Int. Cl.[4] G01G *3/14*

U.S. Cl. 177—211 **21 Claims**



1. Floating beam weigh scale apparatus comprising a base, a load receiving member spaced from the base, first and second pivot members disposed between the base and load receiving [members,] *member,* load transmitting means interconnecting the pivots, the base, and the load receiving member to produce moments in the pivots of opposite sense and about spaced axes, a substantially rigid beam connected to and extending between the pivots, and means carried by the beam for producing a signal related to the bending stress therein over the elastic bending range thereof.

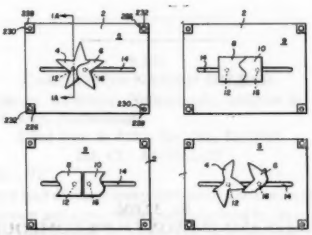
Re. 32,004
TWO-SIDED PUZZLE

Robert E. Clancy, 13 Mays Ave., Hornell, N.Y. 14843

Original No. 4,333,652, dated Jun. 8, 1982, Ser. No. 196,739, Oct. 14, 1980. Application for reissue Jun. 4, 1984, Ser. No. 616,955

Int. Cl.[4] A63F *9/08*

U.S. Cl. 273—153 S **10 Claims**



1. A two-sided puzzle comprising:
a substantially flat support member having upper and lower side surfaces;
at least one elongated slot of a finite width extending through said support member from said lower side surface to said upper side surface;
at least a first plurality of separate, [flat] puzzle members adjacent said upper side surface, each puzzle member having a [non-symmetrical] periphery, said puzzle members further being slidably and rotatably movable relative to one another between at least one matched position, in which portions of said peripheries of said plurality of puzzle members match to form a figure [having a symmetrical periphery,] and an unmatched position, in which said plurality of puzzle members are separate and said peripheries thereof do not match;
at least a second plurality of separate, [flat] puzzle members adjacent said lower side surface, each puzzle member having a [non-symmetrical] periphery, said puzzle members further being slidably and rotatably movable relative to one another between at least one matched position, in which portions of said peripheries of said plurality of puzzle members match to form a figure [having a symmetrical periphery,] and an unmatched position, in which said plurality of puzzle members are separate and said peripheries thereof do not match; and
means extending through and slidable within said slot for rigidly coupling at least one of said puzzle members of said first plurality of puzzle members to a corresponding puzzle member of said second plurality of puzzle members for slidable and rotatable movement of said coupled puzzle members within said slot whereby slidable and rotatable movement of one of said first and second pluralities of puzzle members to its matched position automatically moves the other of said first and second pluralities of puzzle members to an unmatched position.

Re. 32,005

MAGNETIC ALLOY HAVING A LOW MELTING POINT

Takeshi Miyazaki, Omiya, Japan, assignor to Hitachi Metals, Ltd., Tokyo, Japan

Original No. 4,239,533, dated Dec. 16, 1980, Ser. No. 904,321, May 9, 1978. Application for reissue Sep. 17, 1982, Ser. No. 419,507

Claims priority, application Japan, Feb. 6, 1978, 53-12206

Int. Cl.[4] C22C *5/04, 30/00*

U.S. Cl. 148—31.55 4 Claims

3. A magnet alloy which consists of Co, Ni and Pd, and inevitable impurities, the content of Co being in the range of from 7 to 50 weight %, the content of Ni being in the range of 15 to 58 weight %, and the content of Pd being at least 35 wt. %, the alloy having a magnetic flux density value B_{100} of at least 2,000 G and a melting point of not more than 1350° C.

Re. 32,006

13-HALO AND 13-DEOXY C-076 COMPOUNDS

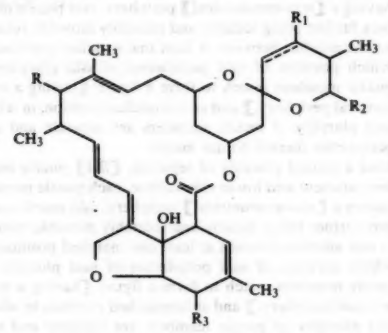
John C. Chabala, Westfield; Michael H. Fisher, Ringoes, and Helmut H. Mrozik, Matawan, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Original No. 4,171,314, dated Oct. 16, 1979, Ser. No. 861,810, Dec. 19, 1977. Application for reissue Jul. 18, 1984, Ser. No. 632,146

Int. Cl.[4] C07D *493/22*

U.S. Cl. 549—264 13 Claims

1. A compound having the formula:



wherein the broken line indicates a single or a double bond;

R is halogen or hydrogen;

R_1 is hydroxy and is present only when said broken line indicates a single bond;

R_2 is [n-propyl] *isopropyl* or sec-butyl; and

R_3 is methoxy or hydroxy.

Re. 32,007

MODE CHANGING SYSTEM FOR A CASSETTE TAPE RECORDER

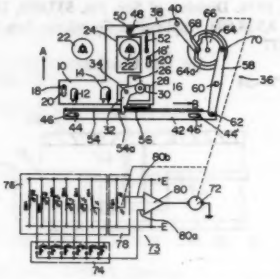
Niro Nakamichi, Higashikurume; Kozo Kobayashi, Kodaira, and Hideo Kawachi, Ichikawa, all of Japan, assignors to Nakamichi Corporation, Tokyo, Japan

Original No. 4,272,792, dated Jun. 9, 1981, Ser. No. 52,020, Jun. 25, 1979. Application for reissue Feb. 16, 1984, Ser. No. 580,867

Claims priority, application Japan, Jun. 28, 1978, 53-78170

Int. Cl.[4] G11B *15/18, 19/02*

U.S. Cl. 360—69 4 Claims



1. A mode changing system for a cassette tape recorder wherein operating members such as a head base plate and a pinch roller are moved in accordance with operating modes of said cassette tape recorder comprising:

control means to control movement of the operating members to take a position corresponding to a selected mode of said cassette tape recorder;

a *bidirectional* control electric motor to actuate said control means;

a mode selective switch group to select one of said modes;

a reference signal generating circuit to generate a reference signal corresponding to the selected one of said modes in accordance with the selection of said modes by means of said mode selective switch group;

a variable signal generating circuit to generate a variable signal which continuously varies with the rotation of said control electric motor; [and]

an operational circuit to receive said reference signal at one of its inputs and said variable signal at the other input to compare said signals to generate a control output so as to rotate said control electric motor, said operational circuit being associated with said control means and said variable signal generating circuit so that said control output is generated for rotating said control electric motor when said operating members are at a position different from the position corresponding to the selected mode and for stopping said control electric motor when said operating members reach the position corresponding to the selected mode;

said control means including a rotary cam means having an advancing rotary range in which said operating member is advanced for engagement with a cassette tape and a retracting rotary range in which said operating member is retracted from the tape corresponding to a plurality of retracting modes, said retracting modes being placed together on said rotary cam means; and

said cam means being reversibly driven by said motor within a predetermined rotary angular range including said advancing and retracting rotary ranges corresponding to the selected operation of said mode selective switch group.

PLANT PATENTS

GRANTED OCTOBER 15, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,572

ROSE PLANT JACREP

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Dec. 2, 1983, Ser. No. 557,200
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—20 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its tall, upright plant, uniform red, lightly fragrant blooms, and mildew resistant foliage.

5,573

PEAR TREE

Lyle A. Brooks, Forest Grove, Oreg., assignor to Carlton Nursery Company, Inc., Dayton, Oreg.

Filed Sep. 20, 1983, Ser. No. 534,178
Int. Cl.[4] A01H *5/03*
U.S. Cl. Plt.—36 1 Claim

1. A new and distinct variety of pear tree refered to by the cultivar designation Old Home × Farmingdale #282 amd substantially as herein shown and described, characterized particularly by its ability to serve as a size-controlling rootstock for grafting of pear tree cultivars to produce "standard" pear trees; further characterized by its resistance to the Fireblight disease and its tolerance of the Pear Decline disease, further characterized by its non-rootsuckering habit, its hardiness, its good root-anchorage, its good graft-compatibility with all major commercial pear varieties, its virus freedom and its ability to root easily and reproduce readily by hardwood cuttings and by other vegetative methods.

5,574

CARNATION NAMED HILBAR

Jan J. Hilverda, Aalsmeer, Netherlands, assignor to Hilverda B.V., Aalsmeer, Netherlands

Filed Dec. 8, 1983, Ser. No. 559,360
Int. Cl.[4] A01H *5/00*
U.S. Cl. Plt.—72 1 Claim

1. The new and distinct spray carnation variety, substantially as herein shown and described, characterized by its continuous and profuse production of small pink flowers, and its rapid growth rate.

PATENTS

GRANTED OCT. 15, 1985

ERRATA

For CLASS	See PATENT NO.
623–001	4,546,499
623–001	4,546,500
623–023	4,546,501
139–304	4,546,780
296–181	4,546,969
405–259	4,547,106
556–014	4,547,321
514–015	4,537,370
514–200	4,537,371
318–592	4,547,692

PATENTS

GRANTED OCTOBER 15, 1985

GENERAL AND MECHANICAL

4,546,491

DEVICE FOR PROTECTION AGAINST ACCELERATIONS

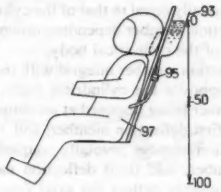
Raymond Beaussant, Bretigny, France, assignor to Intertechnique, Plaisir, France

Filed Aug. 27, 1984, Ser. No. 644,363

Claims priority, application France, Aug. 31, 1983, 83 13975

Int. Cl.[4] A61B *19/00*

U.S. Cl. 2—2.1 A **11 Claims**



1. A device for protection against the effect of accelerations, comprising:

(a) a garment having at least trousers having pockets; and

(b) a control member which, in use, supplies compressed gas to the pockets when the downwardly directed acceleration of the body exceeds a predetermined threshold,

wherein the control member includes a means for setting up in the trouser pockets an overpressure when the predetermined positive acceleration threshold is exceeded in accordance with a substantially linear law of variation having an origin corresponding to a negative acceleration.

4,546,492

GARMENTS AND/OR METHODS OF PROTECTING GARMENTS

Alfred J. Dickenson, Auckland, New Zealand, assignor to Moray Industries Limited, Devonport, New Zealand

Filed Oct. 12, 1983, Ser. No. 541,051

Claims priority, application New Zealand, Mar. 18, 1983, 203624; Jun. 19, 1983, 204749

Int. Cl.[4] A41D *27/12*

U.S. Cl. 2—46 **14 Claims**

1. In a garment formed from a flexible material and having at least one part thereof covering a body joint and subjected to stretching in at least one stretching direction upon movement of the body joint in use, the improvement comprising:

a plurality of sections of flexible sheet material overlying said at least one part of the garment to protect said at least one part against wear and being arranged in overlapping relationship so that part of at least one of said sections overlies part of an adjacent section and said sections lie substantially parallel to and partly in engagement with each other and at least partly against the surface of the garment; and

means to attach said sections to the garment along substantially parallel spaced lines substantially perpendicular to the at least one stretching direction so that the flexibility of the garment is not substantially impaired in the at least one stretching direction.

4,546,493

TAN-THROUGH WEARING APPAREL AND PROCESS FOR MAKING THE SAME

Kenneth A. Bortnick, Rte. 2, Box 154, Parsonsburg, Md. 21849

Filed Sep. 30, 1982, Ser. No. 428,871

Int. Cl.[4] A41D *7/00*; A62B *17/00*

U.S. Cl. 2—67 **13 Claims**

1. Tan-through wearing apparel, comprising:

a. a fabric composed of a material which is substantially transparent to ultra-violet wavelengths and to substantially all wavelengths of light when wet; and,

b. a coating on said fabric for preventing the transmission of light rays of a pre-determined wavelength through said fabric when said apparel is wet.

8. A process for creating tan-through wearing apparel, comprising the steps of:

a. weaving a fabric with warp threads and weft threads composed of a material substantially transparent to ultra-violet wavelengths; and,

b. coating said fabric with a compound having the characteristic of preventing the transmission of light rays of a preselected wavelength through said fabric when said coated fabric is wet by water.

4,546,494

NECKTIE CONSTRUCTION

Michael I. Garber, 282 Davis St., Greenfield, Mass. 01301

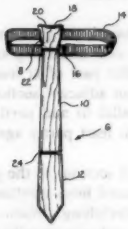
Filed Oct. 22, 1984, Ser. No. 663,764

Int. Cl.[4] A41D *25/00, 25/02*

U.S. Cl. 2—144 **6 Claims**

1. Necktie construction comprising a plurality of relatively rigid pre-shaped panels hingedly interconnected in end-to-end, coplanar relation, one of said panels being generally in the

shape of a four-in-hand knot and at least one other panel being hingedly connected in contiguous relation to the lower end of



the one panel and a flexible neckband attached to said one panel.

4,546,495

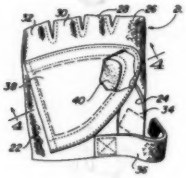
GLOVE APPARATUS FOR WEIGHTLIFTING PRESSES

David D. Castillo, 1202 S. 14th St., Phoenix, Ariz. 85034

Filed Sep. 24, 1984, Ser. No. 653,604

Int. Cl.[4] A41D *19/00*

U.S. Cl. 2—161 A **5 Claims**



1. A glove for the hand of a weightlifter while grasping and lifting a bar, comprising, in combination:

a palm portion for covering substantially the entire palm of the weightlifter's hand;

wedge means disposed on the entire palm portion and extending across the palm portion from the heel of the hand to the inside edge of the hand between the thumb and the index finger, and including a smoothly concave upper portion and a smoothly convex lower portion.

4,546,496

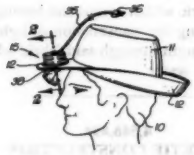
HAT MOUNTED VENTILATION APPARATUS

Willie Lewis, 1019 W. 106th St., Los Angeles, Calif. 90044

Filed Jun. 11, 1984, Ser. No. 619,590

Int. Cl.[4] A61F *9/06*

U.S. Cl. 2—171.3 **2 Claims**



1. A ventilating apparatus for mounting upon head gear comprising:

(a) a cylindrical body having upper and lower ends;

(b) a circular flange secured to the lower end of said cylindrical body about the axis of said cylindrical body, said flange having a circumference which is larger than that of said cylindrical body;

(c) frictional securing means disposed about the outer surface of the cylindrical body for securing the head gear adjacent said circular flange;

(d) a rotary power source coupled to the cylindrical body along the axis thereof;

(e) a multiple bladed impeller coupled to the rotary power source and adapted to rotate about the axis of the cylindrical body;

(f) direct current power means coupled to the rotary power source;

(g) a first semicircular deflection member having a radius which is substantially equal to that of the cylindrical body, said first deflection member depending downwardly from the lower end of the cylindrical body;

(h) a second deflection member integral with the first deflection member opposite the cylindrical body, said second deflection member being disposed at an obtuse angle with respect to the first deflection member; and

(i) a third deflection member pivotally coupled to said first deflection member, said third deflection member being adapted to adjustably deflect the axial flow of air from said multiple bladed impeller.

4,546,497

ANTISTATIC CLOTHING

Kazumasa Ono, Atsugi, and Koichi Okoshi, Tokyo, both of Japan, assignors to Midori Anzen Industry Co., Ltd., Tokyo, Japan

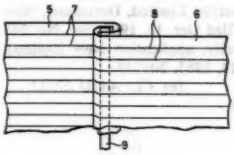
PCT No. PCT/JP83/00114, § 371 Date Aug. 30, 1983, § 102(e) Date Aug. 30, 1983, PCT Pub. No. WO83/03526, PCT Pub. Date Oct. 27, 1983

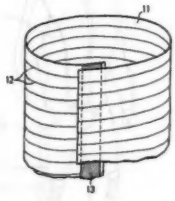
PCT Filed Apr. 14, 1983, Ser. No. 537,400

Claims priority, application Japan, Apr. 15, 1982, 57-53709[U]

Int. Cl.[4] A41D *27/24*

U.S. Cl. 2—243 A **1 Claim**





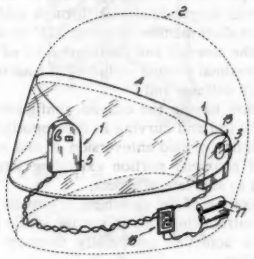
1. A butt-joined seam for antistatic cloth composed of long dust-resistant fibers woven to a high density with parallel electroconductive fibers which do not cross one another woven therein, characterized in that an electroconductive material selected from the group consisting of electroconductive tape, conductive paint and conductive coatings, is disposed at overlaps between pieces of antistatic cloth forming said butt-joined seam.

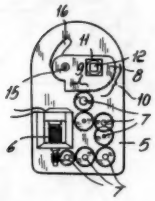
4,546,498

ELECTRICALLY POWERED DEVICE FOR OPENING AND CLOSING THE VISOR OF A CRASH HELMET

Lino Fantin, Via Palazzon 27, Campodoro (Province Padova), Italy

Filed Mar. 7, 1983, Ser. No. 472,437
Claims priority, application Italy, Mar. 8, 1982, 41527 A/82
Int. Cl.⁴ A42B *3/02*
U.S. Cl. 2—424 **3 Claims**





1. An electrically powered device for opening and closing the visor of a crash helmet comprising:

a casing positioned within the temple regions of the motorcyclist's crash helmet;

an electric motor including a reduction gearing and housed in said casing;

a gear segment movably supported on said casing and driven by said motor through said reduction gearing;

a slot formed in the walls of said casing;

a first pin mounted for rotation together with and projecting from said gear segment slidably engaging in said slot and connecting the visor ends to said gear segment;

a cam comprising a first rectilinear portion followed by a second portion in the shape of an arc of a circle,

a second pin projecting from said gear segment and engaging in said cam;

the first portion of said cam having limits, which define a stroke of said second pin, which is equal to the stroke allowed to said first pin by said slot, so that when a rotatory motion is imparted by the motor to the reduction gearing, this rotatory motion is converted first in a linear motion of the gear segment and thereafter the rotatory motion is transmitted to the gear segment, when said gear segment reaches a rotatory condition.

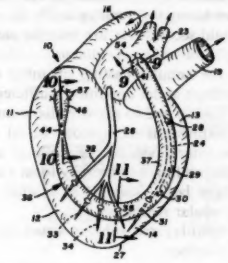
4,546,499

METHOD OF SUPPLYING BLOOD TO BLOOD RECEIVING VESSELS

Zinon C. Possis, and Demetre M. Nicoloff, both of Edina, Minn., assignors to Possis Medical, Inc., Minneapolis, Minn.

Filed Dec. 13, 1982, Ser. No. 448,955
Int. Cl.⁴ A61F *1/24*
U.S. Cl. 623—1 **18 Claims**

1. A method for providing a continuous supply of flowing blood to at least one blood receiving vessel of a living body with an elongated biocompatible vascular graft having an inlet end, an outlet end, a continuous passage extended from the inlet end to the outlet end for accommodating a continuous flow of blood, and blood flow restriction means in the distal portion thereof comprising: securing the inlet end of the graft to a supply of blood under pressure by operation of the heart in a manner to allow blood to flow in said continuous passage, securing at least one portion of the graft between the inlet end



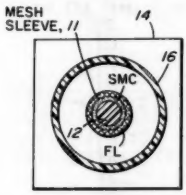
and restriction means to at least one blood receiving vessel in a manner to allow blood to flow from said continuous passage into said blood receiving vessel, and securing the outlet end of the graft to the right atrium section of the heart whereby a continuous flow of blood flows through said passage from the inlet to the outlet end thereof, into the right atrium chamber of the heart said blood flow restriction means being operable to maintain flowing blood at a pressure in said passage sufficient to perfuse the blood receiving vessel.

4,546,500

FABRICATION OF LIVING BLOOD VESSELS AND GLANDULAR TISSUES

Eugene Bell, Dedham, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 261,928, May 8, 1981, Pat. No. 4,539,716. This application Feb. 26, 1982, Ser. No. 352,585
The portion of the term of this patent subsequent to Sep. 10, 2002, has been disclaimed.
Int. Cl.⁴ A61F *1/00*
U.S. Cl. 623—1 **16 Claims**



1. In a method of producing, in vitro, a living multi-layered tubular structure, comprising:

a. producing a first tubular layer by:

(1) forming a first aqueous mixture of collagen fibrils, nutrient medium and a first cellular contractile agent capable of interacting with collagen fibrils;

(2) introducing said first mixture into an annular casting chamber;

(3) maintaining the annular casting chamber containing said first mixture under conditions sufficient to allow a gel to form therein and to allow radial contraction of the gel with expression of aqueous liquid therefrom resulting from interaction of the cellular contractile agent with collagen fibrils to thereby form a contracted

hydrated collagen lattice suitable as one layer of a multi-layered tubular structure; and

(4) removing aqueous liquid expressed in the formation of said first tubular layer from the annular casting chamber;

b. producing a second tubular layer outwardly of said first tubular layer by:

(1) forming a second aqueous mixture of collagen fibrils, nutrient medium and a second cellular contractile agent capable of interacting with collagen fibrils;

(2) introducing said second mixture into the annular casting chamber;

(3) maintaining the annular casting chamber containing said second mixture under conditions sufficient to allow a gel to form therein and to allow radial contraction of the gel with expression of aqueous liquid therefrom resulting from interaction of the cellular contractile agent with collagen fibrils to thereby form a contracted hydrated collagen lattice suitable as another layer of a multi-layered tubular structure; and

c. removing said multi-layered tubular structure from the annular casting chamber;

The improvement comprising adding a reinforcing sleeve of inert material to said living multi-layered tubular structure.

4,546,501

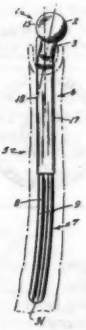
HIP PROSTHESIS

Ramon B. Gustilo, and Richard F. Kyle, both of Hennepin County Medical Center - 701 Park Ave. South, Minneapolis, Minn. 55415

Filed Sep. 28, 1982, Ser. No. 426,092

Int. Cl.[4] A61F *1/04*

U.S. Cl. 623—23 **12 Claims**



1. In a femoral insert for hip joint prosthesis having a spherical shaped head member, a neck member connected to the head member and terminating at a collar, and a shaft member having a proximal portion connected to the collar and extending approximately half the extent of the shaft member, and a distal portion extending therefrom, the improvement comprising

the collar being flush to the anterior and posterior sides of and extending medially from the shaft member;

the proximal portion having a longitudinal axis and a substantially straight lateral aspect, an upper half which is broad in the medial-lateral direction and curved in the medial aspect and having a generally rectangular cross-section which is widest at the collar and gradually tapers to a generally square cross-section, and a lower half which has flat sides and a generally square cross-section of the upper half;

said neck member being anteverted with respect to the collar and proximal portion at an angle of about 10° to 20° and is at angle to said longitudinal axis through said proximal portion of said shaft member of about 125° to about 140°;

at least one of the anterior and posterior sides of the upper half of said proximal portion including at least one porous bony ingrowth surface; and

said distal portion having the curved configuration of an intramedullary rod and curving in the opposite direction from the direction of said anteversion of said neck member, and said proximal portion extending straight in a plane parallel to said lateral aspect,

whereby firm fixation of the prosthesis is initially provided by the distal intramedullary rod portion while long term stabilization is achieved proximally through the bony ingrowth surface.

4,546,502

EVAPORATIVE WASTE DISPOSAL SYSTEM

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 474,967, Mar. 14, 1983, abandoned. This application Oct. 9, 1984, Ser. No. 659,163

Int. Cl.[4] A47K *11/02*

U.S. Cl. 4—449 **16 Claims**

1. A preseparating toilet bowl for roughly separating the liquid waste and the toilet bowl rinsing water from the solid waste comprising in combination:

(a) a toilet bowl of a funnel-shaped tubular construction having a seat disposed at the diverging end of said toilet bowl;

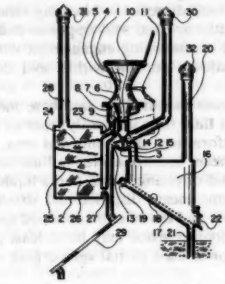
(b) a converging-diverging tubular bottom having a smooth throat section connected to the converging end of said toilet bowl in a smooth and continuous relationship and thus providing a diverging bottom for said toilet bowl;

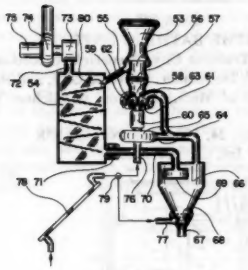
(c) a solid waste tube with an inlet diameter substantially greater than the diameter of said throat section of said converging-diverging tubular bottom and substantially less than the diameter of said diverging bottom of said toilet bowl, said solid waste tube disposed within said diverging bottom of said toilet bowl in a substantially coaxial relationship wherein an annular gap is provided intermediate said diverging bottom of said toilet bowl and said inlet of said solid waste tube; and

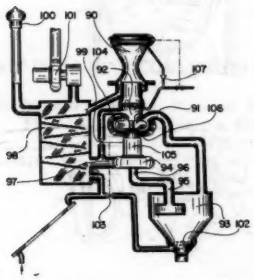
(d) a liquid waste pipe for draining the liquid waste and the toilet rinse water collected at a closed bottom of said annular gap intermediate said diverging bottom of said toilet bowl and said solid waste tube;

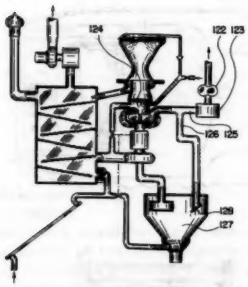
whereby, the liquid waste and the toilet bowl rinsing water landing on the inner wall of said funnel-shaped toilet bowl flows down following the wall of said converging-diverging tubular bottom of said toilet bowl due to surface tension and is discharged through said liquid waste tube, while the solid

waste dropped into said toilet bowl is funneled through said throat of said converging-diverging tubular bottom of said









toilet bowl and drops into said solid waste tube, said solid waste tube discharging the solid waste dropped thereinto.

4,546,503

POOL CHEMICAL TABLET AND CONTAINER

John M. Casberg, Cheshire, Conn., assignor to Olin Corporation, Cheshire, Conn.

Filed Mar. 11, 1985, Ser. No. 710,728

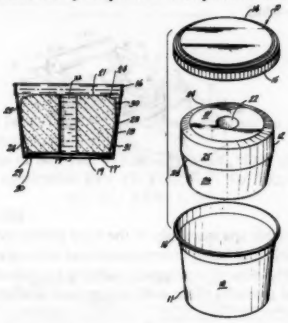
Int. Cl.[4] E04H *3/18*; E03D *9/02*

U.S. Cl. 4—496 **18 Claims**

1. A swimming pool chemical tablet and storage container immersible in water for use in a forced circulation flow system to evenly dispense chemical over an extended period of time, comprising in combination:

(a) a storage container with a top removable prior to immersion in water, a top lip portion cooperative with the removable top, a curved bottom with an outer angled portion and a central generally flat portion, a frusto-conoidally shaped sidewall formed by a closed plane curved surface having an increasing diameter extending from and connecting the upwardly curved bottom to the top lip portion; and

(b) a frusto-conoidally shaped tablet of predetermined height



with a bottom and a top, a bottom tapered sidewall portion, a generally straight sidewall portion above the bottom tapered sidewall portion and joined thereto along a radial sidewall contact surface to form, when inserted within the container, a tablet-sidewall bottom space below the sidewall contact surface in which water initially does not circulate, and a tablet-sidewall flow space in which water can freely circulate above the sidewall contact surface, the sidewall contact surface further contacting the frusto-conoidally shaped sidewall to control the rate of dissolution of the tablet when water is circulated in the forced circulation flow system.

4,546,504

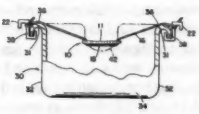
HEAD SUPPORT

Patricia A. Vars, 14 Russell Ave., Pawcatuck, Conn. 06379

Filed Mar. 16, 1984, Ser. No. 590,336

Int. Cl.[4] A54D *19/00*

U.S. Cl. 4—515 **3 Claims**



1. A head support for use with a sink having a pair of opposing sidewalls and a front wall connected to and extending transversely between the sidewalls, the front wall having at least a portion of its upper edge disposed below the upper edges of the sidewalls, said head support consisting of an elongated flexible band of water impervious plastic material having a substantially uniform thickness and apertures proximate its opposite ends, said band having a length substantially greater than its width and substantially less than the transverse dimension of the sink as measured between the upper edges of the sink sidewalls, and means for releasably attaching said band to the sink between the sidewalls and below the level of the upper edges of the sidewalls in suspended relation to the sink and consisting of length of flexible cord extending upwardly through said apertures and having a central portion thereof extending between said apertures and disposed below and

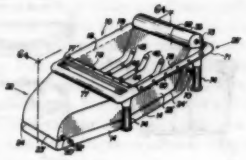
adjacent the lower surface said band and means for releasably securing the opposite end portions of said cord to the upper edges of the sidewalls and consisting of a pair of hooks, each of said hooks, being secured to an associated free end portion of said cord.

4,546,505

PORTABLE SPA

John A. Wakenshaw, 109 Lake Rd., Box 1006, Tavernier, Fla. 33070

Filed Apr. 16, 1984, Ser. No. 601,074
Int. Cl.[4] A61H *33/02*
U.S. Cl. 4—543 **8 Claims**



1. A portable spa assembly of the type primarily designed to be collapsible and being dimensioned and structured to accommodate a plurality of occupants within a contained area being also at least partially filled with water, said assembly comprising:

(a) base means dimensioned to extend along a length of said assembly and configured and disposed for supporting relation to occupants within said assembly,

(b) said base means being inflatable and defining a platform disposed along its length on a support surface and structured for orientation between an expanded, operable position and a collapsed, storable position.

(c) containment means secured to said base means and extendable upwardly therefrom in at least partially surrounding relation to an exposed surface of said platform and disposed and configured to at least partially define a contained area within said assembly and above said platform,

(d) a support means for supporting said assembly in said operable position and comprising a rigid support frame including a plurality of spaced apart upstanding support legs collectively resting on the supporting surface and including a plurality of peripheral portions connected between correspondingly positioned opposite ends of said support legs.

(e) said peripheral portions formed of rigid material and disposed in surrounding relation to and at least partially defining an opening of said contained area, said opening dimensioned and configured to define an entrance for a plurality of occupants into said contained area,

(f) said base means further including an inflatable backrest portion secured to said platform at one end thereof and disposed in exposed relation to said entrance,

(g) said backrest portion extending upwardly and outwardly from said one end of said platform in an angularly inclined position in spaced relation to the supporting surface and into secured and supporting engagement with one of said peripheral portions of said support means, said platform having a substantially elongated configuration and an opposite end thereof disposed beyond said support means,

(h) said platform extending between two of said plurality of support legs and beneath one of said peripheral portions supported between said two legs so as to terminate at said opposite end,

(i) said containment means comprising a containment wall formed of flexible, liquid impermeable material and connected continuously along a major length of a peripheral edge of said platform and extending upwardly therefrom into supported engagement with said support means,

(j) said containment wall further structured and configured to extend upwardly and inwardly from said opposite end of said platform into supported engagement with said one peripheral portion contiguous said entrance,

(k) said containment wall disposed in covering relation to a portion of said platform from said opposite end to said support means and in containing engagement with water overlying said platform portion within said contained area,

(l) fluid directing means mounted on said base means and structured to direct fluid flow upwardly from an exposed surface of said platform into said contained area,

(m) fluid regulating means interconnected in fluid communication with said fluid directing means and a liquid supply and including a pump means disposed and structured to force water flow into and out of said contained space, and

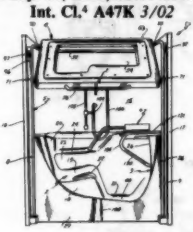
(n) whereby said contained space may be at least partially filled with water for at least partial submerging of occupants therein.

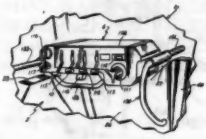
4,546,506

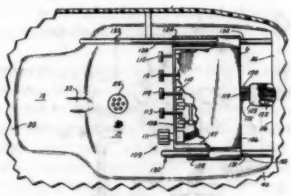
HOME BATHING UNIT

Raymond T. Houle, Traverse City; Frederick A. Kilbourn, Suttons Bay; James E. De Kraker, Traverse City, and Robert T. Nilsson, Cedar, all of Mich., assignors to Silchor, Traverse City, Mich.

Filed Sep. 24, 1984, Ser. No. 653,558
Int. Cl.[4] A47K *3/02*
U.S. Cl. 4—555 **67 Claims**







1. A home bathing unit, comprising:

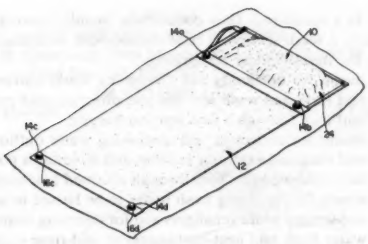
a bathtub having opposite sidewalls and end walls, with an access opening in one of said sidewalls for bather ingress and egress therethrough;
a seat located in said bathtub adjacent to one of said end walls;
a door shaped to selectively close said access opening;
means for vertically guiding said door between a fully open position wherein bather movement through said access opening is permitted, and a fully closed position wherein said door sealingly closes said access opening;
means for securely locking said door in the fully closed position;
a lock actuator operably connected with said locking means, and positioned to be manipulated by a bather disposed on the seat in said bathtub;
a handle located on said door at a position thereon from which a bather disposed on the seat in said bathtub can grasp said handle and manually translate said door between the fully open and fully closed positions;
a door controller, having means for retaining said door in said fully open position until moved therefrom by the bather, and means for adjusting the height of said door in the fully open position, so that said door is high enough to permit the bather to readily enter said bathing unit through said access opening, yet low enough to permit the bather, when disposed on the seat in said bathtub, to reach said handle and close said door, whereby the bather may enter and exit the bathing unit, and open, close and lock said door by himself from a seated position within said bathtub, without requiring an assistant.

4,546,507

BEACH KIT INCLUDING CONVERTIBLE BAG-PILLOW COVER

Eric Weinstein, 3884 Butler Rd., Blynelon, Md. 21011

Filed Jul. 25, 1984, Ser. No. 634,055
Int. Cl.[4] A45C *3/10*; A47G *9/06*
U.S. Cl. 5—419 **1 Claim**



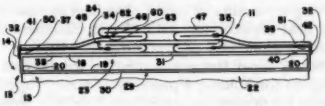
1. A beach kit comprising:
an inflatable pillow;
an elongate beach towel having at least two grommeted openings in each of two opposite edges thereof;
a generally rectangularly shaped cover for said pillow divided by transverse stitching into a first compartment in which the pillow is received and a second, relatively smaller, oppositely facing compartment including closure means at the outside edge thereof; said cover further comprising third and fourth compartments formed along the long edges of the cover, a first pair of reinforcing members received in said third compartment and a second pair of reinforcing members received in said fourth compartment, said cover further comprising fastener means located at the corners thereof for enabling the opposite edges of the cover to be secured together to form a carrying case, said cover further comprising at least two grommeted openings therein which are arranged to be aligned with the grommeted openings in the beach towel; and
a plurality of stakes adapted to be inserted through the openings in said cover and openings in said beach towel in alignment therewith, and through the openings at the opposite edge of the beach towel, for affixing the beach towel, and the cover, with the pillow in an inflated condition received therein, to the sand, while connecting the cover and beach towel together.

4,546,508

BEDDING ASSEMBLY

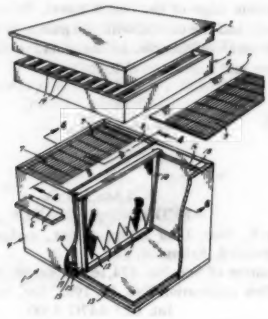
Deborah K. Ison, Deer Lodge, Mont., assignor to Deserdein, Incorporated, Arlington, Tex.

Continuation of Ser. No. 474,163, Mar. 10, 1983, abandoned.
This application Feb. 19, 1985, Ser. No. 702,439
Int. Cl.[4] A47G *9/00*
U.S. Cl. 5—494 **14 Claims**



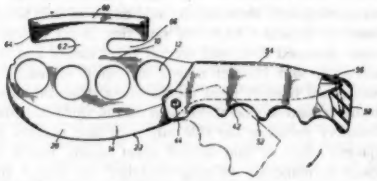
1. A bedding assembly including a base encompassing portion, a base covering portion and a body covering portion; said base encompassing portion including a peripheral section around the periphery of a base including major top and bottom surfaces and sidewall sections joining said major surfaces, said peripheral section extending between the top and bottom surfaces of said base, said peripheral section including an upper edge adjacent said top surface and a lower edge adjacent said bottom surface, at least one connecting section extending over said bottom surface of said base and permanently joining opposite lower edges of said peripheral section; said base covering portion including first sheet means disposed over substantially the entire top surface of said base and in contact therewith, first fastening means releasably securing the edges of said first sheet means to the upper edges of said peripheral section along substantially the entire length thereof; said body covering portion including second sheet means disposed over said first sheet means and in contact therewith, said second sheet means including at least one pleat means, said pleat means extending substantially parallel to the longitudinal axis of said base intermediate and parallel to the edges thereof, second fastening means releasably securing the side edges of said second sheet means to adjacent edges of said first sheet means, blanket means disposed over said second sheet means and in contact therewith, said blanket means including at least one pleat means, said blanket pleat means being disposed substantially parallel to said second sheet pleat means, third fastening means releasably securing the side edges of said blanket means to adjacent edges of said second sheet means, fourth fastening means permanently affixing together the lower transverse edges of said first sheet means, said second sheet means and said blanket means, further including fifth fastening means disposed between the free ends of said pleat means of said second sheet means and the free ends of said pleat means of said blanket means; whereby said first fastening means may be operated without the necessity to operate either the second or third fastening means and the second fastening means may be operated without the necessity to operate either the first or third fastening means.

4,546,509
MULTIPLE QUEEN BEEHIVE
Peter Huetter, 4780 Londonberry Dr., Santa Rosa, Calif. 95401
Filed Jan. 23, 1984, Ser. No. 490,524
Int. Cl.[4] A01K *47/06*
U.S. Cl. 6—1 **2 Claims**



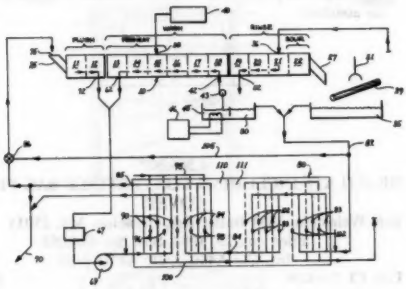
1. A beehive comprising:
a. a hive body in the form of a hollow box open at the top having a plurality of brood chambers capable of conducting heat between any two of said chambers adapted for holding a plurality of brood frames;
b. a honey super frame mounted on top of said hive body adapted for holding a plurality of honey supers;
c. means for preventing queen bees from one brood chamber from entering any other brood chamber comprising at least two rectangular members having a flat rectangular plate attached to one side of each of said members parallel to the plane of said member and adjacent to a plurality of openings sufficiently large to permit the passage of the general bee population through said openings but smaller than the abdomen of the queen bee, removably mounted over at least two brood chambers, each rectangular member having its rectangular plate adjacent to the rectangular plate of at least one other rectangular member at the top of said box; and
d. at least one opening in said hive body adapted for allowing the passage of bees from outside of the hive body into at least one of said brood chambers.

4,546,510
HANDTOOL
Dan W. Harrison, Rte. 1, Box 570, Brownsboro, Tex. 75756
Filed Dec. 3, 1982, Ser. No. 446,780
Int. Cl.[4] B25F *1/00;* **B25G** *1/06, 1/08*
U.S. Cl. 7—145 **20 Claims**



1. A handtool comprising:
a body portion having a cutting surface along one periphery constituting an axe blade formation;
an elongated knife formation extending out of the body portion, said knife formation having at least one sharpened edge; and
a cover pivotally mounted on the body portion so as to be movable between first and second positions, said cover having an elongated body with a first recess configured to cover the sharpened edge of the knife formation when the cover is in the first position and a second recess opposite the first recess and configured to cover the cutting surface of the axe formation when the cover is in the second position.

4,546,511
CONTINUOUS FLOW LAUNDRY SYSTEM AND METHOD
Richard O. Kaufmann, 6050 W. El Camino del Cerro, Tucson, Ariz. 85745
Filed Jul. 16, 1984, Ser. No. 630,980
Int. Cl.[4] D06F *31/00, 39/08*
U.S. Cl. 8—158 **9 Claims**



5. In a continuous flow commercial laundry having a flush section, a wash section, a rinse section, and an extractor section, the improvement comprising:
a. means for collecting and combining water outflow from said flush and wash sections and directing said combined outflows through a first heat exchanger;
b. means for collecting and combining water outflow from said rinse and extractor sections and directing a portion of said combined outflows through a second heat exchanger;
c. means for supplying fresh water to be heated to said first and second heat exchangers and for directing heated fresh water from said heat exchangers to said rinse section.

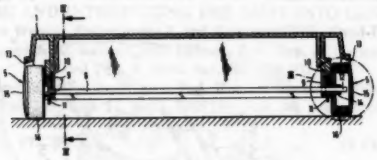
7. A method for recovering heat in a continuous flow commercial laundry having a flush section, a wash section, a rinse section, and an extractor section, comprising the steps:
a. extracting and combining waste water from said flush and wash sections and passing said waste water through a first heat exchanger;
b. extracting and combining outflow water from said rinse and extractor sections and passing said outflow water through a second heat exchanger;
c. passing fresh water through said first heat exchanger in heat exchange relation with said waste water;
d. passing fresh water through said second heat exchanger in heat exchange relation with said outflow water;
e. mixing fresh water flowing from said first and second heat exchangers and directing the mixed fresh water to said rinse section.

4,546,512

MECHANICAL SWEEPER

Johannes Liebscher, Nassau, and Rolf G. Schülein, Singhofen, both of Fed. Rep. of Germany, assignors to Leifheit AG, Nassau, Fed. Rep. of Germany

Filed Nov. 29, 1983, Ser. No. 555,907
Claims priority, application European Pat. Off., Mar. 24, 1983, 83102925.1
Int. Cl.[4] A47L *11/33*
U.S. Cl. 15—41 R 5 Claims



1. A mechanical sweeper of the type including a housing having two oppositely located lateral walls, brush means connected to the housing, a dirt-collecting receptacle positioned in the housing and means for moving the housing over a surface to be cleaned, comprising:

means for supporting the housing on the surface to be cleaned including an assembly having at least one axle with end portions and a wheel mounted on each of said end portions, said wheel having an inner surface including a radially extending projection, the lateral walls each including a slot for removably introducing a respective one of said end portion of said axle into said slot; and

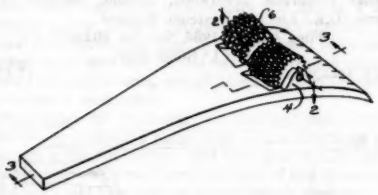
oppositely located protrusions, each of said protrusions extending outwardly from a respective one of the lateral walls and being parallel to and spaced from said respective one of the lateral walls, said wheel projection being positioned and confined between a respective one of the lateral walls and protrusions after introduction of said axle into said slot.

4,546,513

ICE BREAKER AND SCRAPER

Michael D. Hammond, 2040 Monday Dr., Elgin, Ill. 60120

Filed Mar. 22, 1984, Ser. No. 592,277
Int. Cl.[4] B60S *1/04*
U.S. Cl. 15—105 1 Claim



1. A hand-held scraper for removing ice from a surface, said scraper comprising:

a body section with a topside;

a handle connected to one end of the body section;

a blade section connected to the other end of the body section;

a roller section connected to the topside of the body section between the handle and blade section; and

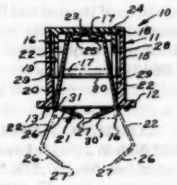
a plurality of rotational rollers having notch-like surfaces circumferentially mounted in the roller section which rotate independently to break up the ice.

4,546,514

CLEANING PAD HOLDER

Dominick J. Tutino, 26 Kawin Ave., Hawthorne, N.J. 07506

Filed Nov. 21, 1983, Ser. No. 432,684
Int. Cl.[4] A47L *25/00*
U.S. Cl. 15—209 D 2 Claims



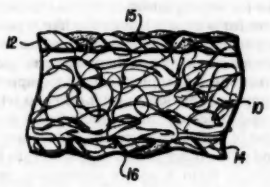
1. A cleaning pad holder comprising a plastic generally cylindrical body having an axial bore therein open at its bottom end, a plunger slidable in said bore and having a lower end projectable from said open end, said bore having an annular radially inwardly projecting rib thereon, said plunger having its lower portion guidably and slidably received in said rib and having an annular flange on its upper portion slidable in said bore and engageable with said rib for limiting downward sliding of said plunger in said bore, and said plunger being a hollow plastic cylinder; said plunger having an end wall; and a pair of spaced apart ribs substantially parallel to each other inside said plunger on said end wall, a leaf spring; said leaf spring having a center portion; legs; said legs biased apart; jaws opposed to each other and extending beyond the bottom rim of said plunger; and said jaws having teeth, said leaf spring center portion affixed to said end wall between said ribs, a pair of cutouts in said plunger; said cutouts opposite each other and terminating at said bottom rim; and said cutouts aligned with said ribs and adapted to receive the legs of said leaf spring extending therethrough, said legs retrievable into said plunger, actuating means engageable with said legs upon retractive movement of said plunger into said body for effecting movement of said jaws toward each other whereby they may be embedded and retained in a cleaning pad for securing said pad to the bottom end of said cleaning pad holder, said actuating means comprising a cam surface on the inner periphery of said cylindrical body engaging said legs and resiliently and radially compressing said pad into said plunger upon upward movement of said plunger into said bore.

4,546,515

SCOURING PAD AND METHOD FOR PRODUCING SAME

William J. Clayton, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 8, 1983, Ser. No. 530,323
Int. Cl.[4] A47L *13/04*
U.S. Cl. 15—209 C 12 Claims



1. A method for producing a scouring pad, comprising:

forming a layer of randomly oriented metal fibers;

disposing a sheet of thermoplastic resin above and below said layer of metal fibers; and

compressing said layer of metal fibers and said sheets of thermoplastic resin at a temperature above the melting point of said resin to form a scouring pad.

11. A scouring pad comprising distinct, matlike top and bottom layers of randomly oriented metal fibers, each of said layers held together by a thermoplastic resin bonding said fibers to one another, said thermoplastic resin covering the upper and lower surfaces of the pad and filling at least some of the spaces between said fibers; and

an interior layer of randomly oriented metal fibers substantially free of said resin.

4,546,516

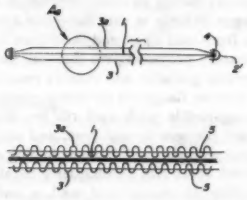
COSMETIC TOWEL

Yoon H. Kim, 19812 50th W., #614, Lynnwood, Wash. 98036

Continuation-in-part of Ser. No. 547,570, Nov. 1, 1983, Pat. No. 4,493,866. This application Sep. 27, 1984, Ser. No. 655,160

Int. Cl.⁴ A47L *17/08;* **B32B** *7/04*

U.S. Cl. 15—210 R **7 Claims**



1. A cosmetic towel or the like comprising:

a planar piece of smooth, slick fabric, and

two pieces of towel, one each of said two pieces of towel being layered on each side of said smooth, slick fabric, said layers of smooth, slick fabric, and towel being stitched together around the edges with sewing thread or the like, the arrangement being such that each of the pieces of towel is in movable relationship with the face of the smooth, slick fabric with which it is superposed.

4,546,517

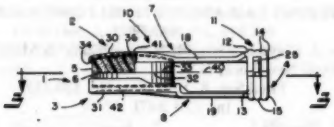
WIPING DEVICE

Joseph E. Caniglia, 5368 E. 134th St., Garfield Heights, Ohio 44125

Continuation-in-part of Ser. No. 301,310, Sep. 11, 1981, Pat. No. 4,434,520. This application Mar. 2, 1984, Ser. No. 585,857

Int. Cl.⁴ G02C *13/00*

U.S. Cl. 15—214 **13 Claims**



1. Apparatus for wiping lenses or the like comprising a pair of wiping means for wiping a lens or the like, a pair of support means for supporting respective wiping means in relation to each other to wipe a lens placed therebetween, and connector means for connecting said support means to support said wiping means in opposed relation to each other to wipe a lens or other device, said connector means including a stepped recess at an end of one of said support means and stepped protrusion means of an end of the other of said support means for insertion into said recess to form a secure connection between said support means, said connector means including means for permitting relative rotation of said support means while still connected together, said stepped recess means comprising a deep recess and a pair of shallow recesses, said recesses being in side-by-side connecting relations, and said stepped protrusion means comprising a relatively long protrusion and a pair of shorter height stepped protrusion members, said long protrusion being positioned in said deep recess and said shallower protrusion members being positioned in respective shallow recesses.

4,546,518

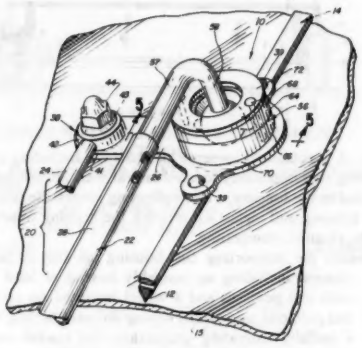
ATTACK ANGLE COMPENSATOR CONNECTOR

William H. Harbison, and Andrew Frankus, both of Valparaiso, Ind., assignors to The Anderson Company of Indiana, Michigan City, Ind.

Filed Mar. 6, 1984, Ser. No. 586,634

Int. Cl.⁴ A47L *1/02;* **B60S** *1/40*

U.S. Cl. 15—250.23 **11 Claims**



6. An attack angle compensator connector for connecting a windshield surface treating blade to a reciprocably pivoting wiper arm to conform the blade to a contoured windshield surface upon pivoting of the wiper arm, said attack angle compensator connector comprising:

a trunnion ball fixed to an end of the wiper arm and having a radially extending follower;

a socket means fixedly associated with the blade, retaining the trunnion ball for limited, universal, relative, rotary motion and defining a cam slot for guiding the follower for predetermined relative movement between the trunnion ball and the socket means upon pivoting of the wiper arm to maintain the blade perpendicular to said windshield surface.

4,546,519

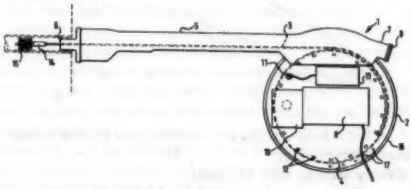
APPARATUS FOR CLEANING TUBES

Lawrence Pembroke, Brentwood, England, assignor to Hyprovac (U.K.) Limited, Rayleigh, England

Filed Apr. 20, 1984, Ser. No. 602,437

Int. Cl.⁴ B08B *9/02*

U.S. Cl. 15—395 **17 Claims**



16. An apparatus for cleaning tubes comprising a hollow barrel; a primary drum containing a coiled resilient tape; means connecting said barrel to said drum so that said tape may pass from said drum, along and out of one end of said barrel; an electric motor operatively connected to the inner end of said tape and arranged to rotate said coil about the axis of said coil and to drive said tape out of said barrel and to retract said tape

into said drum; a cleaning device attached to the outer end of said coil of tape; a vacuum hose connection on said barrel for placing a vacuum hose in communication with the interior of said barrel, thereby to connect said barrel to a vacuum generating apparatus to create suction at said one end of said barrel, said tape being composed of a composite material comprising a resin matrix and longitudinally extending reinforcing strands of glass fibre and of carbon fibre.

4,546,520

DEVICE FOR THE MECHANICAL PROCESSING OF FISH AND INTRODUCING THE SAME INTO CANS

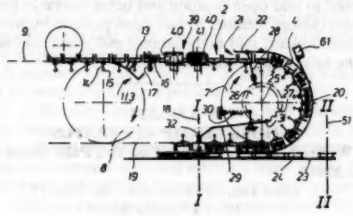
Werner Wenzel, Doberanweg 8, and Reinhard Ollik, Knud-Rassmussenstr. 42, both of 2400 Lübeck, Fed. Rep. of Germany

Filed Feb. 9, 1984, Ser. No. 578,502

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1983, 3305239; Feb. 16, 1983, 3305240; Feb. 16, 1983, 3305241

Int. Cl.[4] A22C *25/14*

U.S. Cl. 17—59 **19 Claims**



1. Device for the mechanical processing of fish having a head, a rump including innards and a tail and introducing the same into cans, especially of small bulk fish like sardines, herrings, sprats or the like for preserving or conserving in preparation ready for consumption, said device comprising

a. rotatingly driven conveyor means carrying trough means, defining a conveying plane and creating an advancing movement in a conveying direction for said trough means, being guided around deflecting elements defining a deflection region, and comprising at least three conveying portions defining two outer and at least one inner conveyor portions, guided parallel to each other, driven synchronously, defining an upper and a lower return run and carrying two rows of outer and at least one row of inner trough elements, respectively, which are arranged in a complementary manner with respect to each other to form said trough means receiving said fish to be processed, each extending transversally and having a base defining a base surface opposite a trough opening and lateral front faces, said inner trough element rows being flanked by at least one of said two outer trough element rows, two neighbouring trough elements rows forming a slot between each other,

b. cutting means for separating said head and said tail from each fish to produce a rump piece with a beheading surface and a tail cut surface, said cutting means including knife means which each penetrate one of said slots down to beneath said base surface of said trough elements,

c. a gutting station arranged downstream of said cutting means for removing said innards from said rump and including suction head means with suction openings arranged on the sides of said slots and with said suction openings coming into functional relationship with said beheading surface of each rump piece in order to remove said innards, and

d. a transfer station arranged downstream of said gutting station for introducing said fish rumps positioned in said inner trough elements into cans advanced in a timed manner with said trough elements into filling position, wherein

e. each of said inner trough elements is provided on said base with a base plate forming a support surface for said fish and being adjustable in height with respect to said conveying plane,

f. an activating element is arranged in the region of said transfer station to be activated in time with said advancing movement of said inner trough elements, which activating element comes into functional relationship with said base plate,

g. said knife means and said suction head means are designed adjustable with respect to their distance from each other by means of a central adjusting mechanism, and

h. said advancing of said cans into said filling positions ensues by means of inserter means which are activatable by signal transmitter means monitoring the filling of each of said inner trough elements in time with said advancing movement of said inner trough elements.

4,546,521

FASTENER FOR SPORTS SHOES

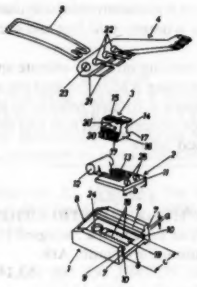
Peter Ribarits, Vienna, Austria, assignor to Skischuhfabrik Dynafit Gesellschaft m.b.H., Graz, Austria

Filed Apr. 11, 1984, Ser. No. 599,170

Claims priority, application Austria, Apr. 11, 1983, 1273/83

Int. Cl.[4] A43C *11/14*

U.S. Cl. 24—70 SK **11 Claims**



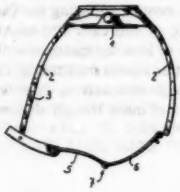
1. A fastener for sports shoes, comprising a base member, which is adapted to be secured to one side part of a quarter of a shoe, a slider, which is mounted on said base member and slidable along the same in a tightening direction and adapted to be fixed in position to said base member, a tightener lever pivoted to said slider, a loop member pivoted to said tightening lever, said base member formed with an elongated aperture, which extends in the tightening direction and formed with teeth protruding into said elongated aperture, said fastener also comprising a locking block, which is inserted from below into said elongated aperture and extends through said elongated aperture and through a registering closely fitting slot formed in said slider and protrudes above said slider and has teeth in mesh with said teeth of said base member, and spring means engaging between said locking block and one of said base member and said shoe quarter for urging said locking block upwardly so that the locking block when depressed against the force of said spring means disengages said teeth of said locking block from said teeth of said base member and the slider and locking block can then be displaced along said elongated aperture.

4,546,522

RELEASABLE HINGE FOR A BRACELET

Claude-André Gygax, Evilard, Switzerland, assignor to Omega SA, Bienne, Switzerland

Filed Jun. 27, 1984, Ser. No. 625,163
Claims priority, application France, Jul. 11, 1983, 83 11918
Int. Cl.⁴ A44C *5/08*
U.S. Cl. 24—71 J **7 Claims**



1. A hinge for joining two parts of a bracelet, said hinge comprising:

at least one assembly rigidly affixed to a first of said parts, said assembly comprising a pin and a first cradle,

said first cradle having a first concave surface extending arcuately approximately 180 degrees,

said first concave surface being disposed coaxially with and partially surrounding said pin but fixed relative to said pin so that there is an arcuate space provided between said pin and said first cradle;

at least one second cradle rigidly affixed to said second part, said second cradle having a second concave surface extending arcuately approximately 180 degrees,

said concave surfaces facing each other when said first and second parts are at a predetermined angular position relative to each other whereby said first and second parts may be separated,

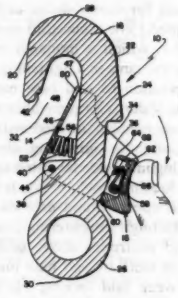
said second cradle rotating into said arcuate space when said second concave surface is adjacent said pin and one of said first and second parts is rotated relative to the other about the axis of said pin whereby said first and second parts are interlocked by said hinge.

4,546,523

SAFETY HOOK CONSTRUCTION

James T. Bailey, Jr., Van Buren, Ark., assignor to United States Forgecraft Corporation, Fort Smith, Ark.

Filed Dec. 19, 1983, Ser. No. 563,141
Int. Cl.⁴ A44B *13/00*
U.S. Cl. 24—241 PP **5 Claims**



1. A safety hook construction comprising:

a. a hook body having a U-shaped portion which defines a first end thereof, and a shank portion which extends from one of the legs of said U-shaped portion to define a second end of said body and cooperates with the other of said legs to define a mouth along one edge of said body;

b. a closure member pivotally mounted on said body and biased to a closed position wherein said mouth is obstructed by said closure member, said closure member being inwardly pivotable to an open position wherein said mouth is at least partially unobstructed and wherein a portion of said closure member is moved toward said body second end; and

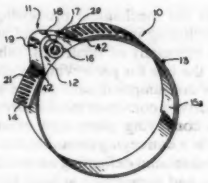
c. a latch pivotally mounted on said closure member, said latch being biased to a locked position wherein it engages said body along the edge thereof which faces outwardly and generally away from said edge along which said mouth is formed to prevent the inward pivoting of said closure member from the closed position thereof, said latch being pivotable to an unlocked position wherein it is disengaged from said body to permit inwardly pivoting of said closure member, said latch being mounted on said portion of said closure member which is moved toward said body second end when said closure member is pivoted to said open position and being operable for moving said closure member to said open position by moving said latch toward said body second end when said latch is in the unlocked position thereof.

4,546,524

HOSE CLAMP APPARATUS

Brad W. Kreft, 3502 A Gardens East Dr., Palm Beach Gardens, Fla. 33410

Filed Feb. 29, 1984, Ser. No. 584,777
Int. Cl.⁴ B65D *63/00*
U.S. Cl. 24—274 R **11 Claims**



1. An improved hose clamp apparatus for alternatively tightening and clamping; or loosening and releasing a hose from about an internally positioned collar in an engine, motor, pump, turbine or the like, and particularly ones in tightly confined or constricted spaces most accessible primarily from a direction substantially parallel to said hose, said apparatus comprising:

hose surrounding means including flexible band means for substantially continuously encircling said hose so as to interpose said hose between said flexible band means and said internally positioned collar;

clamp tightening means operably associated with said hose surrounding means capable of alternatively tightening and loosening said clamp apparatus from about said hose by alternatively reducing and increasing the respective circumference of said flexible band;

said clamp tightening means including adjustment means which are oriented substantially parallel to the central longitudinal axis of said hose being clamped;

tightness locking means operably connected to said tightening means and said flexible band means for maintaining said flexible band means in a desired set circumferential;

said tightness locking means being selectively moveable to an engaged locked and a disengaged unlocked position through manipulation of said adjustment means;

said flexible band means, clamp tightening means adjustment means and tightness locking means cooperating to allow selective tightening and loosening of said flexible band means simultaneous with the disengagement and engage-

ment of said tightness locking means at a position substantially parallel to the central axis of said clamped hose, all through operation of said adjustment means;

said hose surrounding means comprising said flexible band means including a band capable of extending about the periphery of said hose being clamped so as to enable overlapping of first and second layers thereof, and

said band having a plurality of substantially transverse slots formed along at least a portion of its length in said second layer with said portion being positioned immediately below said clamp tightening means;

said clamp tightening means comprising a housing having a front wall and a rear wall and forming at its lower end, a slotted region,

said housing being operably affixed to said slotted band first layer so as to permit said second layer of said slotted band to slide through said slotted region and, in turn, said housing,

said adjusting means including a shaft member being oriented and being translatable along an axis substantially parallel to the central axis of said hose being clamped,

said second layer of said flexible band passing through said housing between said shaft member and said first layer of said overlapped flexible band,

said shaft member having a plurality of gear teeth arranged about its periphery along a portion of its length;

said gear teeth being capable of engaging said plurality of substantially transverse slots formed in said flexible band so as to change the amount of said overlap between said flexible band second layer and said first layer of said flexible band when said shaft is rotated, so as to correspondingly reduce or increase the circumference of said flexible band to tighten or loosen, respectively, said clamp apparatus,

said shaft member having first and second ends being translatably and rotatably mounted through said housing,

said shaft member having a head configuration at said first end, capable of being engaged by a correspondingly shaped tool;

said tightness locking means comprising at least one gear engagement members operably affixed to said housing capable of preventing rotation of said shaft member when said tightness locking means are in said engaged position,

an elastically compressible member interposed between said shaft member and one of said walls of said housing so as to exert a biasing force upon said shaft member,

said shaft member being spring biased towards said engaged position,

said shaft member being rotatable and capable of changing the circumference of said flexible band when an axial force component sufficient to defeat said spring biasing is applied thereto and said gear engagement means disengaged, and

said biasing force serving to return said shaft member to said engaged position when said axial force component is eliminated.

4,546,525

APPARATUS FOR THE MASS PRODUCTION OF A GASKET-BEARING AEROSOL MOUNTING CUP

Robert H. Abplanalp, 10 Hewitt Ave., Bronxville, N.Y. 10708

Division of Ser. No. 332,510, Dec. 21, 1981, abandoned, which is a continuation of Ser. No. 112,791, Feb. 1, 1980, abandoned. This application Dec. 27, 1983, Ser. No. 565,703

Int. Cl.[4] **B21B** *15/00;* **B21D** *39/03;* **B23P** *23/04, 25/00*

U.S. Cl. 29—33 K **13 Claims**

1. An apparatus for the mass production of a gasket-bearing aerosol mounting cup having a panel, a skirt depending from the periphery of the panel and an annular channel extending outwardly from the skirt comprising:

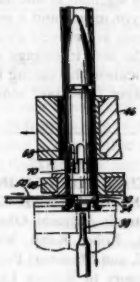
(a) means for positioning the ungasketed mounting cup to a predetermined station,

(b) a mandrel member having a portion fixed in position with respect to the mounting cup and a portion reciprocally moveable with respect to the mounting cup and the fixed portion of the mandrel,

(c) means for advancing a continuous sleeve of gasket material onto the mandrel member,

(d) means for aligning the sleeve-bearing mandrel member and the skirt of the mounting cup and positioning the mandrel member the desired distance from said skirt,

(e) means for urging the moveable portion of the mandrel toward the mounting cup, thereby advancing the sleeve of gasket material onto the skirt of the mounting cup,



(f) means for returning the moveable portion of the mandrel to its initial position,

(g) means for cutting the sleeve of gasket material beyond the skirt of the mounting cup to form a band of gasket material on the skirt of the mounting cup,

(h) means for advancing the gasket band onto the skirt, such that the band of gasket material does not extend beyond said skirt.

4,546,526

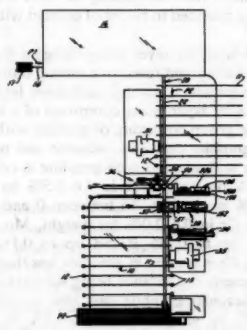
APPARATUS FOR AXIALLY SHIFTING WIRE SEGMENTS IN BELT TYPE CONVEYOR

Robert O. Dusel, Brookfield, and Gerald E. Blaha, Waukesha, both of Wis., assignors to Artos Engineering Company, New Berlin, Wis.

Filed Jun. 22, 1983, Ser. No. 507,239

Int. Cl.[4] **H01R** *43/04;* **H05K** *13/06*

U.S. Cl. 29—33 M **18 Claims**



1. In combination:

conveyor means for conveying an elongated wire segment along a path with the wire axis transverse to said path, said conveyor means including gripping means for releasably gripping said wire segment initially near one end and subsequently near the other end;

means for temporarily releasing said gripping means to

enable said wire segment to be shifted axially relative to said conveyor;

shifter means for axially shifting said wire segment while said gripping means are released to enable regripping of said wire segment near said other end;

movable sensing means for sensing when said wire segment has been shifted axially a desired distance and for providing a signal for preventing further shifting by said shifter means,

and means to move said sensing means between a first position wherein said sensing means are adapted to initially engage said wire segment at one axial location therealong near said conveyor means and a second position wherein said sensing means are moved away from said conveyor means so as to be able to engage said wire segment at a different axial location therealong from whence said wire segment disengages from said sensing means to provide said signal.

4,546,527

COMPOSITE SLEEVE FOR USE IN ROLLING ROLLS FOR H-SECTION STEEL AND CHANNEL STEEL

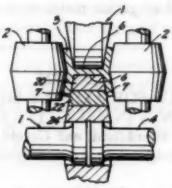
Masahiro Fukuda, Itami; Akitoshi Okabayashi, Nishinomiya; Tadashi Narahara, Kobe; Kenji Muramatsu, Amagasaki; Noriyuki Miyazaki, and Masanori Fukushima, both of Sakai, all of Japan, assignors to Kubota Ltd., Osaka and Nippon Steel Corporation, Tokyo, both of, Japan

Filed Nov. 29, 1982, Ser. No. 445,270

Claims priority, application Japan, Dec. 1, 1981, 56-193818; Dec. 1, 1981, 56-193819; Dec. 1, 1981, 56-193820; Dec. 1, 1981, 56-193821; Dec. 1, 1981, 56-193822; Dec. 1, 1981, 56-193823

Int. Cl.[4] B21B *27/02*

U.S. Cl. 29—132 **14 Claims**



1. A composite sleeve for use in a hot-rolling roll for H-section and channel steel comprising an outer working layer and an inner layer intended to be out of contact with said steel to be hot-rolled,

said outer-working layer comprising in turn a first outer layer covering and fused to a second outer layer which in turn covers and is fused to said inner layer,

said first outer layer being comprised of a material selected from the group consisting of adamite with graphite, spheroidal graphite cast iron, adamite and mixtures thereof, wherein said adamite with graphite is comprised of C in 2.0–3.2% by weight, Si in 0.6–2.5% by weight, Mn in 0.4–1.5% by weight, Ni between 0 and up to 2.5% by weight, Cr in 0.5–2.0% by weight, Mo in 0.2–2.0% by weight, up to 0.1% P and up to 0.1% S by weight, wherein Cr is present in amounts less than 1.5 the amount of Si present, the balance being substantially Fe; wherein said spheroidal graphite cast iron is comprised of C in 2.8–3.8% by weight, Si in 1.2–3.0% by weight, Mn in 0.2–1.0% by weight, between 0 and up to 3.0% by weight Ni, Cr in 0.1–1.0% by weight, Mo in 0.2–2.0% by weight, Mg in 0.02–0.1% by weight, up to 0.1% P and up to 0.04% S by weight, balance being substantially Fe, and wherein said adamite comprises C in 2.2–3.0% by weight, Si 0.2–1.5% by weight, Mn in 0.4–1.5% by weight, between 0 and up to 2.5% Ni, Cr in 0.5–4.0% by weight where Cr is present in amounts at least as much as 1.5 times the amount of Si, Mo in 0.2–2.0% by weight, up to 0.1% P and up to 0.1% S by weight, the balance being substantially Fe;

said second outer layer comprising a material selected from the group consisting of adamite, high chromium iron and mixtures thereof, wherein said adamite is comprised of C in 1.8–3.0% by weight, Si in 0.2–1.5% by weight, Mn in 0.4–1.5% by weight, Ni in 0.5–3.5% by weight, Cr in 0.5–6.0% by weight, Mo in 0.5–2.5% by weight, up to 0.1% P and up to 0.1% S by weight, the balance being substantially Fe and wherein said high chromium iron comprises C in 2.0–3.2% by weight, Si in 0.3–1.5% by weight, Mn in 0.4–1.5% by weight, Ni in 0.5–3.5% by weight, Cr in 8.0–25.0% by weight, Mo in 0.5–2.5% by weight, up to 0.1% P and up to 0.1% S by weight, the balance being substantially Fe;

said inner layer being comprised of a material selected from the group consisting of spheroidal graphite cast steel, spheroidal graphite cast iron and mixtures thereof, wherein said spheroidal graphite cast steel comprises C in 1.0–2.0% by weight, Si in 0.6–3.0% by weight, Mn in 0.2–1.0% by weight, Ni in 0.1–2.0% by weight, Cr in 0.1–3.0% by weight, Mo in 0.1–1.0% by weight, up to 0.1% by weight P and up to 0.1% by weight S by weight, balance being substantially Fe, and said spheroidal graphite cast iron comprises C in 2.8–3.8% by weight, Si in 1.5–3.2% by weight, Mn in 0.3–1.0% by weight, between 0 and up to 2.0% by weight Ni, between 0 and up to 3.0% by weight Cr, between 0 and up to 0.6% by weight Mo, Mg in 0.02–0.1% by weight, up to 0.1% by weight P and up to 0.03% by weight S, balance being substantially Fe.

4,546,528

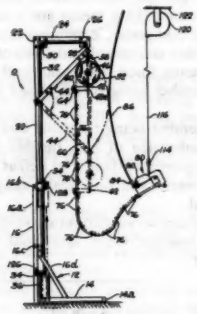
CLIP WRAPPING TOOL APPARATUS

Arthur Langas, Glenview, Ill., assignor to Hartco Company, Skokie, Ill.

Filed Mar. 6, 1984, Ser. No. 586,670

Int. Cl.[4] B23P *11/00*

U.S. Cl. 29—243.56 **27 Claims**



1. Apparatus for use with a clinching tool capable at high speeds of sequentially severing and wrapping clips on overlying wire members employed in the manufacture of furniture, mattress innersprings, and the like, to secure the wire members together, comprising: a plurality of interconnected clips oscillatingly wound into the form of a convoluted, elongated, cylindrically shaped roll; support means for said roll, said support means including horizontally disposed roll retaining means for enabling the interconnected clips to be oscillatingly unwound from the roll; and flexible clip guide means for guiding the interconnected clips as they are oscillatingly unwound from the roll to a pull-fed clinching tool capable at high speeds of sequentially severing and wrapping the clips on the overlying wire members of the workpiece.

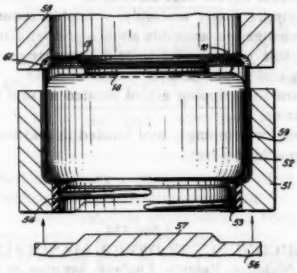
4,546,529
METHOD OF FABRICATING CONTAINER WITH METAL SKIN

Daniel Martin Saint Leon, L'Hay les Roses, France, assignor to Estee Lauder Inc., New York, N.Y.

Division of Ser. No. 459,736, Jan. 20, 1983, abandoned. This application Apr. 9, 1984, Ser. No. 597,873

Int. Cl.⁴ B21D *39/00*; B23P *11/00*

U.S. Cl. 29—455 R **5 Claims**



1. A method for forming a container having a metal skin on a vessel having a bottom, a side wall extending vertically from the bottom and an inwardly extending shoulder region at the top of the side wall extending inwardly to an opening for providing the access to the vessl, comprising:

placing a metal shell having an elongated side wall and curved shoulder region and central opening in a holding member;

inserting a vessel into the metal shell to abut said inwardly extending shoulder region against the curved shoulder region of the metal shell;

placing a substantially planar metal plate on the bottom of the vessel;

crimping the bottom edge of the metal shell about the metal plate to overlap said plate and clamp said plate against the bottom of the vessel therein by a crimping tool displaced towards the metal shell and bottom plate.

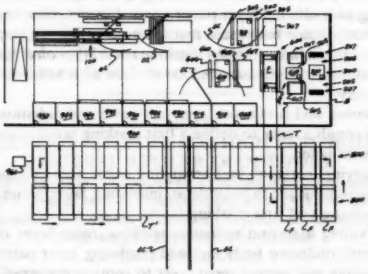
4,546,530
METHOD FOR PRODUCING A MODULAR BUILDING UNIT

Jihad F. Rizk, Beirut, Lebanon, assignor to Polyfab S.A.R.L., Beirut, Lebanon

Filed Jun. 14, 1983, Ser. No. 504,365

Int. Cl.⁴ B23P *11/00*; E04H *1/00*

U.S. Cl. 29—430 **13 Claims**



1. A process for producing a building module comprising the steps of:

(a) fabricating a pair of skeletal portal frame subsections, a skeletal floor frame subsection and a skeletal roof frame subsection;

(b) positioning said frame subsections at predetermined locations at a final frame assembly site and bringing jigs for each subsection and such subsection into engagement to properly locate and support said subsection at a proper attitude with respect to said other subsections for frame assembly;

(c) securing said roof and floor frame subsections to said portal frame subsections while said jigs are in engagement therewith to construct a skeletal module frame;

(d) raising jigs for said floor frame to raise said module frame, removing said jigs for said portal frames and said roof frame, removably securing trackway roller means to said module frame and lowering said floor frame jigs to locate said trackway roller means on a trackway for said module and remove said floor frame jigs;

(e) moving said module frame along said trackway to a floor station and producing a monolithic reinforced concrete floor in situ on said floor frame of said module thereat; and

(f) moving said module frame along said trackway past a plurality of further stations and finishing a predetermined portion of said module at each station so that the modular is virtually complete when it is moved away from the last of said stations and ready for transit to a building site.

4,546,531
SET OF COMPONENTS FOR BUILDING MACHINE TOOLS

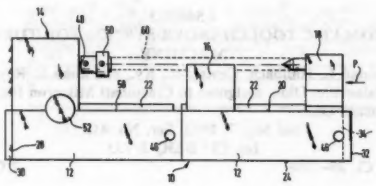
Josef Maleschew, Elsbethen, Austria, assignor to Maier & Co., Hallein, Austria

Filed Jan. 3, 1984, Ser. No. 567,760

Claims priority, application Fed. Rep. of Germany, Jan. 3, 1983, 8300040

Int. Cl.⁴ B23Q *37/00*

U.S. Cl. 29—560 **13 Claims**



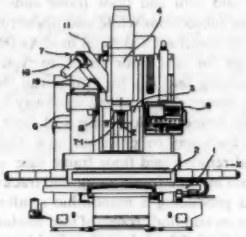
1. A set of components for building machine tools, said set comprising at least one elongated machine bed, and at least one other component held to and adjustably guided on said machine bed by means of a groove and spline guide running in the longitudinal direction of said machine bed, said machine bed being divided perpendicularly to its longitudinal direction into at least two longitudinally aligned sections connected to one another by means of a groove and spline connection whose cross sectional dimensions correspond to that of said groove and spline guide between said bed and said other component so that said two sections of said bed may be disconnected from one another and reassembled with their longitudinal axes perpendicular to one another and with a groove and spline connection existing between the end face of one section and the longitudinal face of the other section.

4,546,532

AUTOMATIC TOOL CHANGING APPARATUS

Koichiro Kitamura, Takaoka, Japan, assignor to Kitamura Machinery Co., Ltd., Takaoka, Japan

Filed Jul. 25, 1983, Ser. No. 516,559
Claims priority, application Japan, Jul. 30, 1982, 57-133353
Int. Cl.[4] B23Q 3/157
U.S. Cl. 29—568 8 Claims



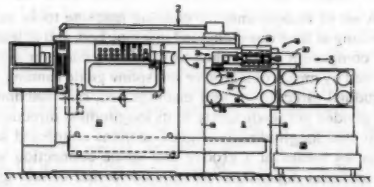
1. In an automatically controlled machine tool in which the axis of a spindle and the axis of a tool at a tool changing station of a magazine proper are arranged preferably to cross each other at right angles with a predetermined spacing therebetween, an automatic tool changing apparatus rotatable about a turning shaft disposed between said spindle axis and said tool axis, said turning shaft having an axis inclined at an acute angle relative to each of said spindle axis and said tool axis, movable support means linearly movably carried on a base mounted on said turning shaft, said linear movement being perpendicular to the axis of said tool and of said spindle, and an arm having tool gripping claw means at opposite ends thereof, said arm pivotally carried on said movable support means at a pivot point between said ends so as to be rotatable through at least a half turn and movable in a direction perpendicular to the direction of movement of said movable support means, and wherein in the tool changing operation said gripping claw means are alternately movable from a first position adjacent the tool axis to a second position adjacent the spindle axis and are positioned so as to cross each of said spindle axis and said tool axis, respectively, at right angles.

4,546,533

AUTOMATIC TOOLCHANGER SYSTEM FOR TURNING MACHINE

Raymond L. Hallbach, Covington, Ky., and John S. Reynolds, Maineville, Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Sep. 7, 1982, Ser. No. 415,518
Int. Cl.[4] B23Q 3/155
U.S. Cl. 29—568 2 Claims



1. A tool changer system for turning machines utilizing turning tools carried in discrete tool holders supported in a tool turret, comprising:

(a) a tool changer base;

(b) a tool storage magazine received on said base and releasably secured thereto;

(c) a slideway secured to said base;

(d) a primary slide moveable on said slideway in reverse directions;

(e) a secondary slide carried by said primary slide, and moveable relative thereto in said reverse directions;

(f) an interchange arm, rotatably mounted to said secondary slide, and rotatable with respect thereto about an arm axis transverse to said slide directions;

(g) a gripper finger assembly, rotatably mounted to said interchange arm assembly about a gripper axis, and axially moveable with respect to said interchange arm housing along said gripper axis;

(h) means for gripping a tool located in said tool storage magazine;

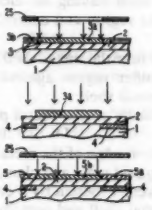
(i) means for gripping a tool located in said tool holder on said machine turret.

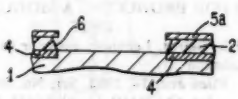
4,546,534

SEMICONDUCTOR DEVICE MANUFACTURE

Keith H. Nicholas, Reigate, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 27, 1983, Ser. No. 461,328
Claims priority, application United Kingdom, Mar. 17, 1982, 8207712
Int. Cl.[4] H01L 21/265, 21/312
U.S. Cl. 29—571 30 Claims





16. A method of manufacturing a semiconductor device having an insulating layer pattern on a doped surface region of a semiconductor body, said method comprising the steps of

providing a first radiation sensitive resist layer on at least one insulating layer on a major surface of a semiconductor body,

exposing said first resist layer to a patterned radiation beam through a mask to define a first masking layer in said first resist layer,

removing parts of said insulating layer free of said first masking layer to provide an insulating layer pattern,

removing said first masking layer,

providing a second radiation sensitive resist layer on said semiconductor body and said insulating layer pattern,

exposing said second resist layer to another patterned radiation beam through said same mask to define a second masking layer in said second resist layer, and

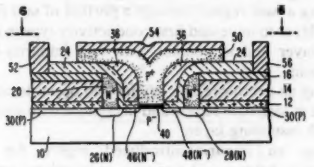
forming a doped region in said semiconductor body at surface areas free of said second masking layer.

4,546,535

METHOD OF MAKING SUBMICRON FET STRUCTURE

Joseph F. Shepard, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 12, 1983, Ser. No. 560,624
Int. Cl.[4] H01L *21/225, 21/28*
U.S. Cl. 29—571 6 Claims



1. A method of forming a small area field effect transistor device and making contact thereto comprising:

providing a monocrystalline semiconductor body whose at least surface region is of a first conductivity;

forming an insulating layer on said surface region;

forming a substantially horizontal, patterned first conductive layer over said insulating layer;

masking and etching said insulating and first conductive layers to provide an opening in said layers to the semiconductor body where the source, drain and gate regions of said device is desired to be formed;

said opening have substantially vertical surfaces on the layered structure;

forming a conformal highly doped of a second conductivity conductive layer over said openings having said substantially vertical surfaces and over said insulating and patterned conductive layer;

etching said conformal conductive layer to substantially remove the horizontal portions of said conformal layer while leaving said opening with a substantially vertical said conformal conductive layer on the designated sides of said opening;

heating said body and said layered structure at a suitable temperature to cause dopant of a second conductivity to diffuse into said body from said conformal conductive layer to form said source and drain regions and first insulator layer upon the surface of the said first conductive layer and said conformal conductor layer;

forming a second insulator layer over said vertical conformal conductive layer;

forming a gate dielectric on the surface of said semiconductor body between the said source and drain region;

forming a gate conductive layer over said gate dielectric;

forming electrical contacts to said patterned first conductive layer through said first insulator layer which effectively makes electrical contacts to said source and drain regions through said first patterned conductive layer and said vertical conformal conductive layers; and

forming an electrical contact to said gate conductive layer.

4,546,536

FABRICATION METHODS FOR HIGH PERFORMANCE LATERAL BIPOLAR TRANSISTORS

Narasipur G. Anantha, Hopewell Junction; Jacob Riseman, and Paul J. Tsang, both of Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 4, 1983, Ser. No. 520,365
Int. Cl.[4] H01L *21/22, 27/08, 21/76*
U.S. Cl. 29—571 15 Claims

1. Method for fabricating a high performance lateral PNP transistor comprising:

providing a monocrystalline semiconductor body having a principal surface of N conductivity type and a buries N+ region with an N+ reach-through connecting said buried region to said surface;

forming a first P+ polycrystalline silicon layer over said surface so that portions of the layer is in direct contact with the areas designated to be the collector regions;

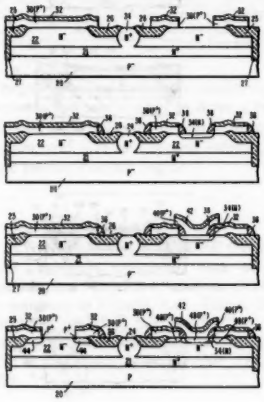
forming an insulator layer upon the top surface of said first polycrystalline silicon layer;

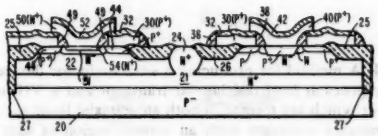
patterning said first polycrystalline silicon layer and insulator layer with substantially vertical edges wherein the layer is removed from over areas designated to be the emitter and base regions of said transistor;

diffusing N type impurities into the said designated emitter and intrinsic base regions;

forming a vertical insulator on said vertical edges of said first polycrystalline silicon layer;

heating the structure to fully form the collector region by outdiffusion from said first polycrystalline silicon layer;





etching a substantially vertical walled groove in said monocrystalline semiconductor body using the patterned first polycrystalline silicon layer with top insulator and vertical insulator as the etching mask;

ion implanting oxygen into the bottom of said groove to form a silicon dioxide region at the bottom of the groove;

forming a second P+ polycrystalline silicon layer in said groove;

heating the structure to form the P+ emitter region around the side edges of the said P+ polycrystalline silicon filled said groove; and

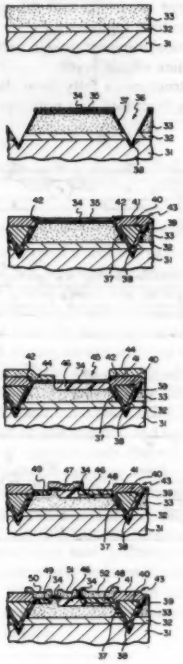
making contact to said transistor wherein said first polycrystalline silicon layer is the collector contact, said second polycrystalline silicon layer is the emitter contact and said N+ reach-through from the surface makes contact through the said buried N+ region to the base region.

4,546,537

METHOD FOR PRODUCING A SEMICONDUCTOR DEVICE UTILIZING V-GROOVE ETCHING AND THERMAL OXIDATION

Yunosuke Kawabe, and Yoshinobu Momma, both of Kitakami, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 150,685, May 16, 1980, abandoned.
This application Feb. 10, 1984, Ser. No. 578,592
Claims priority, application Japan, May 18, 1979, 54-61229
Int. Cl.[4] H01L *21/302, 21/76*
U.S. Cl. 29—576 W **3 Claims**



1. A method for producing a semiconductor device which comprises at least one bipolar transistor and a VIP isolating layer which are formed in both an epitaxial layer and a semiconductor substrate, with an emitter region of said bipolar transistor coming into contact with said VIP isolating layer, comprising the steps of:

forming a buried layer in said semiconductor substrate having a first conductivity type, the buried layer having the opposite conductivity type;

forming said epitaxial layer having said opposite conductivity type on said semiconductor substrate;

forming a first insulating layer on said epitaxial layer;

forming an oxidation masking layer on said first insulating layer;

selectively etching said oxidation masking layer and said first insulating layer to form an opening;

anisotrophically etching said epitaxial layer and said semiconductor substrate through said opening to form a V-groove, the bottom peak of which enters said semiconductor substrate through said buried layer;

introducing impurities having said first conductivity type into exposed portions of said epitaxial layer and said semiconductor substrate in said V-groove;

selectively oxidizing said exposed portions in said V-groove to form a second insulating layer;

forming a polycrystalline silicon layer on said second insulating layer to fill said V-groove;

selectively oxidizing said polycrystalline silicon layer to form a relatively thick insulating layer of silicon dioxide including a bird's beak;

removing said oxidation masking layer;

forming a base region through a portion of said first insulating layer to have said first conductivity type in said epitaxial layer and in contact with said impurity-introduced region;

forming an emitter region having said opposite conductivity type in said base region and in contact with said relatively thick insulating layer;

forming an impurity-introduced region for electrical contact, having said opposite conductivity type, in said epitaxial layer outside of said base and emitter regions; and

forming electrodes on portions of said base emitter and impurity-introduced regions for electrical contact.

4,546,538

METHOD OF MANUFACTURING SEMICONDUCTOR INTEGRATED CIRCUIT DEVICES HAVING DIELECTRIC ISOLATION REGIONS

Kenichi Suzuki, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Sep. 5, 1984, Ser. No. 647,827
Claims priority, application Japan, Sep. 5, 1983, 58-161900
Int. Cl.[4] H01L *21/31, 21/76*
U.S. Cl. 29—576 W **7 Claims**

1. A method of making a semiconductor integrated circuit device comprising the steps of;

sequentially forming on a top surface of a semiconductor body a first oxidation-resistant layer, a polycrystalline silicon layer on said first oxidation-resistant layer, a second oxidation-resistant layer on said polycrystalline silicon layer and an etching-resistant layer on said second oxidation-resistant mask layer;

applying a photoresist layer on the entire surface of said etching-resistant layer;

selectively removing said photoresist layer to form a photoresist mask having openings;

said openings being walled by a first photoresist layer over a portion of said semiconductor body intended as a deeper isolation region and a second photoresist layer over a portion of said semiconductor body intended as a wider isolation region;

removing said second oxidation-resistant layer and said etching-resistant layer in said openings to expose a surface of said polycrystalline silicon layer;

subjecting the structure obtained by said steps to an isotropic etching process to side-etch said etching-resistant layer under said second photoresist layer by a desired width, while said etching-resistant layer under said first photoresist layer is completely removed away;

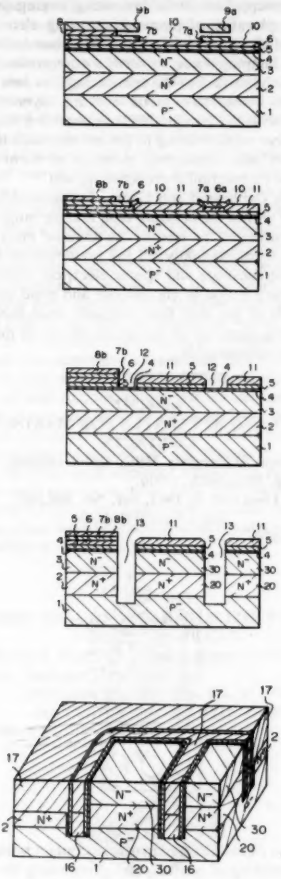
removing said first and second photoresist layers to expose said etching-resistant layer and said second oxidation-resistant layer;

subjecting the structure obtained by said steps to a heat oxidation process to convert said exposed polycrystalline silicon layer into a silicon oxide layer;

subjecting the structure obtained by said steps to an etching process to sequentially remove said exposed second oxidation-resistant layer, said polycrystalline silicon layer and said first oxidation-resistant layer; and

subjecting the structure obtained by said steps to a reactive

etching process to form deep grooves surrounding active regions in said semiconductor body by using as an etching



mask said etching-resistant layer and said silicon oxide layer.

4,546,539

I²L STRUCTURE AND FABRICATION PROCESS COMPATIBLE WITH HIGH VOLTAGE BIPOLAR TRANSISTORS

James D. Beasom, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Dec. 8, 1982, Ser. No. 447,946
Int. Cl.⁴ H01L *21/72, 21/82*
U.S. Cl. 29—577 C **13 Claims**

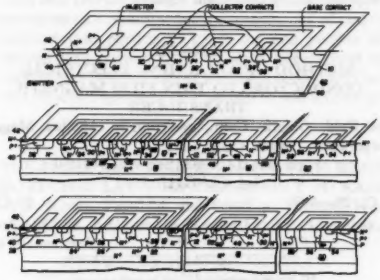
1. A method of fabricating vertical bipolar transistors and an integrated injection logic device simultaneously comprising:

introducing and diffusing impurities of a first conductivity type into a first and second isolated substrate region of a second conductivity type opposite said first conductivity type to form a collector region of said vertical bipolar transistor in said first substrate region and a base region of said logic in said second substrate region;

introducing impurities of said second conductivity type into said vertical bipolar collector region to form a base region, and into said logic base region to form a collector region;

introducing impurities of said first conductivity type into said second substrate region to form an injector region;

introducing impurities of said first conductivity type into said vertical bipolar base region to form an emitter region;



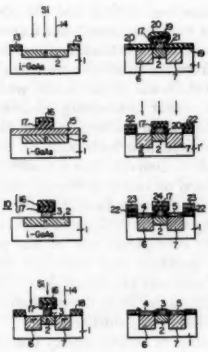
introducing impurities of said second conductivity type into said vertical bipolar base region to form a base contact region, into said logic collector region to form a collector contact region, and into said second substrate region to form a logic emitter contact region.

4,546,540

SELF-ALIGNED MANUFACTURE OF FET

Kiichi Ueyanagi; Yasunari Umemoto, both of Kokubunji; Susumu Takahashi, and Michiharu Nakamura, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 13, 1983, Ser. No. 531,709
Claims priority, application Japan, Sep. 16, 1982, 57-159611
Int. Cl.⁴ H01L *29/48, 29/80, 21/308, 21/265*
U.S. Cl. 29—579 **27 Claims**



1. A method of manufacturing a Schottky gate FET comprising the steps of:

(a) forming a gate electrode of metallic material and a mask member on a semiconductor substrate, said gate electrode of metallic material being in Schottky contact to the semiconductor substrate, said mask member overhanging a periphery of the gate electrode;

(b) ion-implanting impurities into the semiconductor substrate using said mask member as a mask, to form a source region and a drain region thereby forming an intermediate structure;

(c) depositing insulator on a surface of the intermediate

structure, including a side surface of the gate electrode overhung by the mask member;

(d) etching said deposited insulator to expose the source region and the drain region using at least said mask member as a mask, while leaving the insulator at least at the side surface of the gate electrode; and

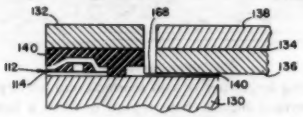
(e) forming a source electrode and a drain electrode on the exposed source and drain regions.

4,546,541

METHOD OF ATTACHING ELECTRICAL CONDUCTORS TO THIN FILM MAGNETIC TRANSDUCER

James Reid, Goleta, Calif., assignor to Applied Magnetics Corporation, Goleta, Calif.

Filed Oct. 14, 1983, Ser. No. 542,050
Int. Cl.[4] G11B *5/42*
U.S. Cl. 29—603 **10 Claims**



1. A method of simultaneously attaching electrical conductors to conductive leads of a thin film magnetic transducer having a transducing element located on one side thereof and a plurality of substantially planar conductive leads formed into a predetermined pattern extending therefrom on a different side of the thin film magnetic transducer in a direction opposite to the side thereof having the transducing element comprising the steps of

mounting the thin film magnetic transducer on a substrate having a medium contacting surface and a supporting surface which is substantially perpendicular to the medium contacting surface wherein the thin film magnetic transducer transducing element is positioned adjacent the medium contacting surface and the conductive leads of the thin film magnetic transducer formed into the predetermined pattern are extended along the supporting surface away from the medium contacting surface;

positioning an electrical circuit means which terminates in a plurality of planar connecting elements formed in the same predetermined pattern as said thin film magnetic transducer conductive leads wherein the connecting elements include a relatively thin diffusible conductive metal coating located on one side thereof with said one side of the connecting elements having said diffusible conductive metal coating thereon positioned with one of the connecting elements contiguous one of the planar conductive connecting members and with the plurality of planar connecting elements extending along the support surface of the substrate away from the medium contacting surface forming a transducing subassembly;

placing a quantity of curable epoxy bonding material adjacent the plurality of planar connecting elements contiguous the conductive leads of the thin film magnetic transducer, said curable epoxy bonding material being selected of a material which is electrically and magnetically compatible with the thin film magnetic transducer and which has a curing temperature below a thermal stress temperature at which at least one of the electrical characteristics and the magnetic characteristics of the thin film magnetic transducer are permanently distorted;

controllably heating the subassembly at a heating rate which permits the thermal stresses of the subassembly to be maintained at a level to avoid damage to the subassembly during heating thereof up to a temperature located in a bonding temperature range between the curing temperature of the curable epoxy bonding material and below the thermal stress temperature;

during the step of controllably heating, urging the substrate and the plurality of planar connecting elements of the electrical circuit means forming the subassembly together with a clamping force to form a compression boundary between the surface of the connecting elements having the diffusible conductive metal coating layer in intimate contact with the conductive leads enabling the diffusible conductive metal coating to diffuse into both the conductive leads and connecting elements to form a diffused electrical connection therebetween; and

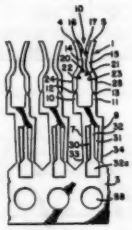
maintaining the heated and clamped subassembly at a temperature within the bonding temperature range for a time period sufficient to enable the curable epoxy bonding material to substantially fill the predetermined space between the substrate and spacer electrical circuit member by capillary action to encapsulate and bond said conductive leads of the thin film magnetic transducer and the connecting elements of the electrical circuit member into a bonded subassembly.

4,546,542

METHOD AND APPARATUS FOR MAKING FORK CONTACTS

Ralph A. Proud, Willoughby Hills, Ohio, assignor to Symbex Corporation, Painesville, Ohio

Filed Oct. 8, 1981, Ser. No. 309,568
Int. Cl.[4] H01R *43/00*
U.S. Cl. 29—874 **21 Claims**



1. A method of making a planar fork contact which method includes the twisting of contact tines, comprising the following steps:

die cutting a strip of a first material with a axially extending inlay of a second contacting material integral therewith to form parallel pairs of elongated tines with respective coplanar surfaces and the contacting material integral with such respective coplanar surfaces,

forming a convex section in each tine so that the tine is convex out of the major plane of the contact at a portion thereof that includes such contacting material, whereby each tine has a contacting area including contacting material at such convex section,

reducing the width in each of the tines at a predetermined location remote from the connecting material to provide a weakened area operative to confine the area of twist to such predetermined location, and

after performing said die cutting, forming and width-reducing steps, twisting adjacent tines of at least one pair thereof in opposite directions at said predetermined location to rotate such coplanar surfaces to place such convex sections back into the major plane of the contact in convex confronting relation with each other and to place such contacting areas in substantially confronting relation with each other.

12. An apparatus for making planar fork contacts including upper and lower relatively reciprocatable bases having a plu-

rality of stations connected with said bases for forming the contacts therebetween, comprising

means operatively associated with said apparatus for indexing a strip of material having an axially extending inlay of a second contacting material integral therewith successively along a path through said stations,

one of said stations having cutting means connected with said bases for die cutting the strip to form parallel pairs of elongated tines with respective coplanar surfaces and the contacting material integral therewith,

a second of said stations having forming means connected to at least one of the bases for forming a convex section in each tine so that the tine is convex about an axis parallel to the axis of the inlay and out of the major plane of the contact at a portion thereof that includes such contacting material whereby each tine has a contacting area including contacting material at such convex section,

means connected to at least one of the bases located along the strip path through said stations physically operative upon each of the tines to reduce the width in each of the tines at a predetermined location remote from the inlay therein thus providing a weakened area operative to confine an area of twist to such predetermined location, and

a third of said stations, subsequent to said means to define and said one and second of said stations, having twisting means connected to at least one of the bases for twisting adjacent tines of at least one pair thereof in opposite directions to rotate such coplanar surfaces of each tine and to place such convex sections back into the major plane of the contact in convex confronting relation with each other and to place such contacting areas in substantial confronting relation with each other.

4,546,543

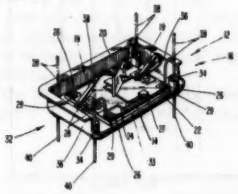
METHODS OF AND APPARATUS FOR FORMING A PROJECTING LEAD

John B. Phaneuf, Haverhill, Mass., assignor to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Dec. 19, 1983, Ser. No. 562,955

Int. Cl.[4] H01R *43/00*; B21F *21/00*

U.S. Cl. 29—884 **7 Claims**



1. A method of simultaneously forming leads which project from a first surface, which comprises:

simultaneously bending intermediate portions of the projecting portions of said leads to form first and second lead portions, said second lead portions being inclined with respect to said first lead portions and said intermediate portions being in opposed facing relationship with each other; and

simultaneously engaging said inclined second lead portions for movement of the ends thereof against a second surface, and thereby bending end portions of said leads into positions essentially parallel to said second surface.

3. Apparatus for forming a lead which projects from a first surface, which comprises:

support means;

first lead bending means movably mounted on said support means for bending an intermediate portion of the projecting portion of said lead to form a first lead portion and a second lead portion inclined from said first lead portion;

said first lead bending means including a mandrel mounted for movement into position adjacent said intermediate portion of said lead, and a bending member positioned for movement adjacent said mandrel for engaging said projecting lead portion and bending said intermediate portion about said mandrel to thereby form said first and second lead portions;

second lead bending means positioned on said support means adjacent said mandrel for movement into engagement with said second inclined lead portion; and

a second surface positioned relative to the end of said second inclined lead portion to cause the end portion of said second lead portion to bend, upon engagement of said second lead bending means with such second lead portion, in a direction appoximately parallel to said second surface.

4,546,544

ONE-PIECE DISPOSABLE RAZOR WITH BLADE PROTECTOR LATCHED RELEASABLY TO RAZOR

Ernest F. Kiraly, Fairfield, and Frank A. Ferraro, Trumbull, both of Conn., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jun. 28, 1984, Ser. No. 625,434

Int. Cl.[4] B26B *21/40*

U.S. Cl. 30—90 **4 Claims**

1. A one-piece low cost disposable razor comprising a head having a support surface for receiving at least one single cutting edge blade and having a face-engaging surface opposite said support surface, said face-engaging surface having a forward margin adjacent a blade cutting edge and an opposite rear margin adjacent a rear edge of a blade, a guard bar, a handle and a temporary blade edge protector all molded as a single piece-part, said protector being joined to said head by means of breakaway links located at said rear margin of said face-engaging surface, and protector being operable to overlay the face-engaging surface and to engage the head releasably when said links are broken, one of said head and said protector being formed with a pair of latching elements for engaging mating indentations on the other of said head and said protector.

4,546,545

PINEAPPLE CUTTER

Tsugutoshi Hirano, Kita-Koiwa 3-chome 26-10, Tokyo, Japan

Filed Nov. 30, 1983, Ser. No. 556,547

Claims priority, application Japan, Jan. 21, 1983, 58-005946[U]

Int. Cl.[4] B26B *3/00*; A47J *25/00*

U.S. Cl. 30—128 **7 Claims**

1. A pineapple cutter comprising:

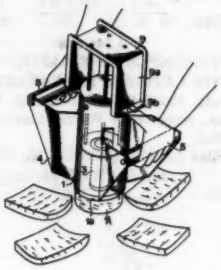
a tubular outer body having a cutter edge around the end portion of a lower end of said tubular outer body;

a tubular inner body positioned within and having its axis substantially parallel to the axis of said tubular outer body,

said inner body having a cutter edge around the end portion of a lower end of said inner body;

a pair of handles spaced outwardly from the outer surface of said tubular outer body, each handle carried by a pair of spaced supporting plates secured to and extending outwardly of said tubular outer body and having cutting edges at the lower end portions thereof to cut the outer peel of the pineapple into separate sections;

a plurality of pressing sheets slidably carried in the inner portion of said tubular outer body and slidable in the axial direction, said pressing sheets including a first, annular pressing sheet slidably carried between said tubular outer



body and said inner body, and a second pressing sheet slidably carried within said inner body; and

a pressing member extending outwardly of the upper portion of said tubular outer body and movable axially relative thereto, said pressing member including connection means for connecting said pressing member with the pressing sheets; and thereby obtaining a substantially annular cut pineapple by pressing down said cutter onto a pineapple and then pressing down on the pressing member to move the pressing sheets of said pressing member downwardly toward the cutter edges of the tubular outer body so that the interior of the pineapple may be separated from its core.

4,546,546

APPARATUS FOR CUTTING OUT FLAT GOODS OR STRUCTURES APPLIED TO A BASE FABRIC

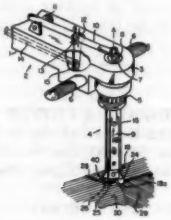
Ferdinand Kleger, Rorschach, and Hans Zeller, Rebstein, both of Switzerland, assignors to Perfekta Maschinenbau Ferdinand Kleger AG, Rorschach, Switzerland

Filed Mar. 5, 1984, Ser. No. 586,325

Claims priority, application Switzerland, Mar. 22, 1983, 1548/83

Int. Cl.[4] B26B *15/00*

U.S. Cl. 30—273 **12 Claims**



1. A cutting apparatus for cutting-out flat goods or shapes appliqued to a base fabric, comprising:

a housing movably supported in a spaced relationship from a predetermined cutting plane;

a substantially vertically extending shaft rotatably mounted in said housing and having a lower end;

a shear mounted at said lower end of said shaft;

said shear comprising:

fixed knife means possessing a knife edge defining said predetermined cutting plane and sloping slightly downwardly from said cutting plane;

movable cutter means resiliently supported in sliding contact at said fixed knife means and possessing a cutting edge;

said shaft being rotatable in order to align said knife edge of said fixed knife means to a predetermind cut to be made; and

said movable cutter means executing cutting strokes in cooperative relation with said fixed knife means.

4,546,547

CHECKING AND ALIGNING STAND TO BE USED IN A CONTINUOUS CASTING PLANT

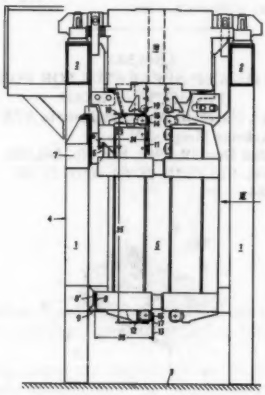
Werner Scheurecker; Alois Scheinecker; Johannes Cordella, all of Linz, and Kurt Engel, Leonding, all of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Aug. 19, 1982, Ser. No. 409,507

Claims priority, application Austria, Sep. 22, 1981, 4066/81

Int. Cl.[4] G01B *5/25*

U.S. Cl. 33—182 **5 Claims**



1. In a checking and aligning stand to be used in a continuous casting plant having a strand guide composed of structure sections, and first seats for accommodating each of said structure sections, said structure sections including supporting rollers forming rollerways, said checking and aligning stand serving to measure and align said structure sections for positioning in said strand guide and including second seats defining a position of at least one structure section and means for determining the position of said supporting rollers of said at least one structure section, the improvement wherein

second seats are provided in said checking and aligning stand in positions corresponding to said first seats of said continuous casting plant strand guide, and wherein

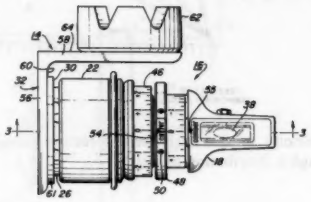
said means for determining the position of said supporting rollers include at least one pair of measuring surfaces provided in the region of said second seats and arranged at an angle relative to each other for determining a set of coordinates of said rollerway relative to said second seats of said checking and aligning stand and defining the position of said structure section.

4,546,548

DEVICE AND METHOD FOR MEASURING STEERING AXIS INCLINATION OR A STEERABLE WHEEL

James K. Bullock, Sr., Wadsworth, Ill., assignor to Ammco Tools, Inc., North Chicago, Ill.

Filed Dec. 8, 1983, Ser. No. 559,627
Int. Cl.[4] G01B 5/255
U.S. Cl. 33—203 9 Claims



1. A method of measuring the steering axis inclination of a steerable wheel mounted on a spindle with a caster gauge having adjustable means operatively associated with a caster scale for determining the angle of the spindle from the horizontal within a vertical plane comprising the steps of:

magnetically mounting to the hub of the wheel an adaptor having a planar magnetic mounting surface lying parallel to the axis of rotation of the wheel;

moving the wheel to a first predetermined angular position to one side of a stright ahead position;

magnetically mounting said caster gauge to said planar magnetic mounting surface in a horizontal plane perpendicular to the spindle;

adjusting the angle determining means to a reference position;

moving the wheel to a second predetermined position to the opposite side of the straight ahead position;

adjusting the angle determining means to determine the magnitude of vertical angular movement of the spindle between the first and second positions;

determining from the caster scale the amount of movement of the angle determining means which effected said determination of the magn tude of vertical angular movement of the spindle; and,

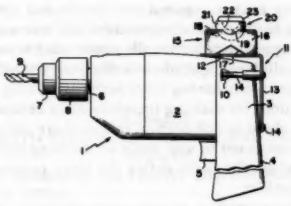
calculating the steering axis inclination using said determined amount of movement of the angle determining means.

4,546,549

ADJUSTABLE SPIRIT LEVEL CONSTRUCTION

Terry Duperon, 5693 Becker Road, Saginaw, Mich. 48601

Filed Jul. 5, 1984, Ser. No. 628,519
Int. Cl.[4] B23B 45/00
U.S. Cl. 33—334 8 Claims



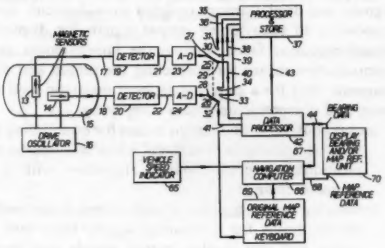
1. A magnetic and adjustable spirit level construction adapted for use in connection with a hand or other adjustable-position tool, said construction comprising a support member formed of magnetically permeable material, one surface of said support member having a partly spherical recess therein; a partly spherical body member formed on a radius corresponding to that of said recess and accommodated therein, said body member being formed of magnetically permeable material and having an opening therein in communication with an internal cavity in said body member; a liquid occupying said cavity; and a transparent closure for sealing said opening, said liquid being present in such an amount as to enable a gas bubble to form in said cavity, said body member being universally adjustable relative to said support member, and one of said members being magnetized thereby enabling said body member to be retained in said recess in any one of a plurality of selected positions of adjustment relative to said support member.

4,546,550

COMPASS

Brian G. Marchent, Portsmouth, and Michael R. Foster, Salisbury, both of England, assignors to Plessey Overseas Ltd., Ilford, England

Filed Oct. 12, 1983, Ser. No. 541,052
Claims priority, application United Kingdom, Oct. 12, 1982, 8229134
Int. Cl.[4] G01C 17/38
U.S. Cl. 33—356 6 Claims



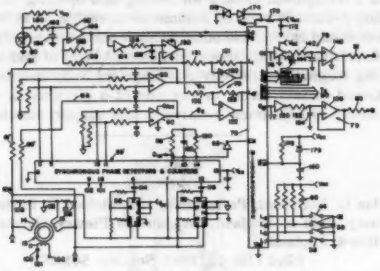
1. A navigation system for vehicles which includes an electronic compass comprising at least two magnetic sensors arranged in use to be respectively responsive to orthogonal components of a magnetic field which includes the earth's magnetic field and a spurious magnetic field comprising the permanent and induced magnetic fields associated with a vehicle in which the navigation system is installed, for producing electrical signals corresponding to said components, data storage means arranged to store signals derived from the sensors as the vehicle is turned through all headings during a compass setting cycle, and signal processor means responsive to electrical signals produced by the sensors in the system after the setting cycle has been completed which electrical signals must lie on the locus of an ellipse, and responsive also to the signals stored during the setting cycle, which stored signals are utilized to modify the said electrical signals in accordance with an algorithm to compensate for the permanent magnetic field by effectively repositioning the center of the ellipse to zero and to compensate for the induced magnetic field by effectively converting the elliptical shape to a circle, whereby signals are provided to the signal processor means indicative of the bearing appertaining to the heading of the vehicle in which the effects of the spurious magnetic field are compensated for, means for sensing the velocity of the vehicle in which the compass is mounted, data infeed means operable for providing data appertaining to an original map reference, navigation computer means responsive to data derived from the velocity indicator, the compass, and the data infeed means for providing data for display means whereby the display means is arranged to provide a display indicative of the position or location of the vehicle.

4,546,551

ELECTRICAL CONTROL SYSTEM

Jeffrey L. Franks, Houston, Tex., assignor to Prince Corporation, Holland, Mich.

Filed Mar. 24, 1983, Ser. No. 478,364
Int. Cl.[4] G01C *17/28*
U.S. Cl. 33—356 **26 Claims**



1. An electrical compass system for a vehicle, said system including sensing means for sensing a magnetic field and providing output signals representative thereof, circuit means coupled to said sensing means for providing display output signals, and display means coupled to said circuit means and responsive to said display output signals for displaying the sensed magnetic field; wherein the improvement comprises compensation means for correcting the sensed and displayed magnetic field for a steady state local magnetic field interference; said compensation means comprising:

means coupled to said circuit means for establishing a predetermined display output signal when said sensing means is positioned in predetermined alignment with a known magnetic field;

comparing means coupled to said sensing means and to said circuit means for comparing signals from said sensing means and said display output signals and applying a control signal to said circuit means when signals from said sensing means correspond to a direction which differs from said predetermined display output signal; and

means coupled to said circuit means and to said sensing means for applying a correction signal to said sensing means and said correction signal generated by said circuit means in response to said control signal from said comparing means to cause said predetermined display output signal to occur.

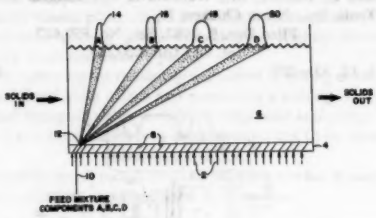
4,546,552

FLUID INDUCED TRANSVERSE FLOW MAGNETICALLY STABILIZED FLUIDIZED BED

Robert P. Cahn, Millburn, and Jeffrey H. Siegell, Westfield, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 345,096, Feb. 2, 1982, abandoned. This application May 7, 1984, Ser. No. 607,408
Int. Cl.[4] F28D *13/00;* **F26B** *17/10*
U.S. Cl. 34—1 **20 Claims**

1. In a process for effecting fluid-solids contacting under fluidization conditions wherein a bed comprising fluidized magnetizable particles is contacted in a vessel with a fluidizing fluid which passes into the lower portion of said bed and exits from the upper surface of the bed, said bed being stabilized by a magnetic means having a strength sufficient to suppress solids backmixing, the improvement which comprises transporting at least a portion of said particles in a direction transverse to the flow of the fluidizing fluid exiting said bed by contacting said particles with at least a portion of the fluidizing fluid entering into said bed, said entering fluidizing fluid having a component



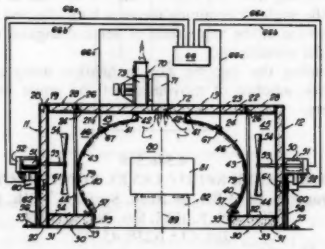
of velocity in said transverse direction caused by passage through a distribution means.

4,546,553

RADIANT WALL OVEN AND PROCESS OF DRYING COATED OBJECTS

Willie H. Best, 18C The Heritage, Columbia, S.C. 29203

Continuation-in-part of Ser. No. 282,531, Jul. 13, 1981, Pat. No. 4,426,792, which is a continuation of Ser. No. 104,339, Dec. 17, 1979, abandoned, which is a division of Ser. No. 916,214, Jun. 16, 1978, Pat. No. 4,235,023. This application Aug. 3, 1983, Ser. No. 519,859
Int. Cl.[4] F26B *3/28, 23/10*
U.S. Cl. 34—39 **23 Claims**



1. A radiant oven comprising:

(a) a housing having opposed side panels and a top panel extending between the upper ends of said side wall panels;

(b) spaced opposed radiant walls within said housing, said radiant walls being spaced inwardly from said side panels, said radiant walls having inner surfaces curving in opposite directions for defining therebetween a central heating chamber about which both of said wall are curved;

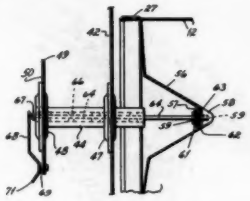
(c) means connected to said walls for forming outer chambers in which the walls define the inner portions of the outer chambers;

(d) means for providing, to said outer chambers, heated air for heating the outer surfaces of said walls to operating temperatures at which a majority of the radiant energy is emitted from the inner surfaces of said walls at wave lengths of 5 microns or greater.

4,546,554
CLOTHES DRYER HAVING VARIABLE POSITION MOTOR AND MOISTURE SENSOR

Norman J. Bullock, Prospect; Paul F. Barnett, Louisville, and Donald J. Lattis, Pewee Valley, all of Ky., assignors to Cissell Manufacturing Company, Louisville, Ky.

Filed Nov. 30, 1982, Ser. No. 445,740
Int. Cl.⁴ F26B *11/04*
U.S. Cl. 34—48 **2 Claims**



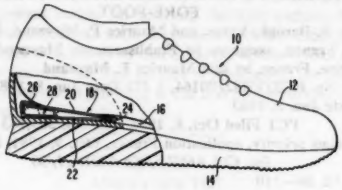
1. In a clothes dryer including a housing having a drying chamber, a perforated clothes drying drum of a electrically conductive material which is electrically coupled to a common potential, rotatably mounted in the drying chamber of the housing, a motor mounted in the housing, means, including a hollow drum drive shaft, coupled between the motor and the drum for rotating the drum, the drum being substantially cylindrical and having a central axis with the hollow drum drive shaft being substantially aligned with said drum axis, a heater mounted in the housing, and means driven by the motor for drawing air past the heater and through the perforated drum and drying chamber and for exhausting the air from the housing, a moisture-sensing arrangement comprising: a cone assembly forming a central portion of a rear wall of the drum including a frusto-conical electrically conductive cone body extending into the drum and electrically coupled thereto and to the housing, an electrically conductive tip mounted on and forming the tip of the cone body, and an insulator interposed between the electrically conductive tip and the cone body, the cone body and the insulator and the electrically conductive tip forming a continuous, relatively smooth generally conical surface in the interior of the drum, the electrically conductive tip being aligned with the axis of the drum and the hollow drum drive shaft, an electrical conductor coupled to the electrically conductive tip and passing through the cone and within the hollow drum drive shaft out of the housing terminating in an electrical contact, the contact and the conductor and the cone assembly being mechanically coupled together to rotate with the hollow drum drive shaft, a contact arm mechanically secured to the housing and electrically insulated therefrom having an end portion contacting the rotatable electrical contact which terminates the conductor, the contact arm being electrically coupled to means for producing an electrical potential which is coupled through the contact arm and the conductor to the tip so that the tip receives an electrical charge relative to that of the drum and the housing, the contact arm being further coupled to means for measuring electrical current flow between the tip and the drum in response to moist clothing in the drum contacting the tip and the electrically common cone and drum.

4,546,555
SHOE WITH SHOCK ABSORBING AND STABIIZING MEANS

Richard G. Spademan, 130 Country Club Dr. #30, Incline Village, Nev. 89502

Filed Mar. 21, 1983, Ser. No. 477,052
Int. Cl.⁴ A43B *7/06, 7/08*
U.S. Cl. 36—28 **40 Claims**

1. A shoe comprising: an upper shell; a lower sole secured to the upper shell; a shock absorber mounted on the shoe for cushioning the foot during foot strike; a first means coupled to the shoe and extending upwardly from the lower sole and

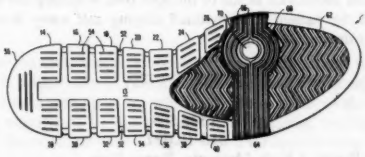


second means shiftable relative to the first means for providing lateral stability for the foot during foot strike.

4,546,556
BASKETBALL SHOE SOLE

Jerry D. Stubblefield, Portland, Oreg., assignor to Pensa, Inc., Portland, Oreg.

Continuation of Ser. No. 250,899, Apr. 3, 1981, Pat. No. 4,449,307. This application Jan. 17, 1984, Ser. No. 571,498
The portion of the term of this patent subsequent to May 22, 2001, has been disclaimed.
Int. Cl.⁴ A43B *13/04, 13/18, 5/00*
U.S. Cl. 36—32 R **22 Claims**



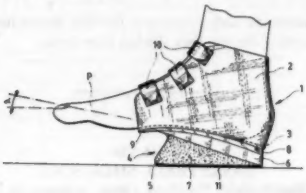
1. A sole for a court shoe, which comprises:
an outer surface having a central portion and a peripheral portion;
a plurality of resilient tread members extending downwardly and outwardly from said central portion to said peripheral portion of said outer surface to form a transverse concavity;
an inner surface having a central portion and a peripheral portion;
a side wall extending upwardly from said peripheral portion of said inner surface so as to define cup means adapted to receive a shoe upper therewithin;
said tread members adapted to be flexed upwardly and spread laterally outwardly upon foot-induced ground impact for dissipating shock away from the foot; and
cavity means provided about said peripheral portion of said inner surface of said sole for facilitating flexing of said tread members, said cavity means comprising a space positioned adjacent said side wall about said peripheral portion of said inner surface under said cup means and above said tread members for reducing resistance to movement of said tread members upon flexing of said tread members upon foot-induced ground impact.

4,546,557

SHOE, MORE ESPECIALLY FOR PATIENTS HAVING UNDERGONE A SURGICAL OPERATION ON THE FORE-FOOT

Louis S. Barouk, Yvrac, and Maurice P. Mayzaud, Brive, both of France, assignors to Etablissements Mayzaud Maurice, Brive, France, by said Maurice P. Mayzaud

PCT No. PCT/FR82/00164, § 371 Date Jun. 8, 1983, § 102(e) Date Jun. 8, 1983
PCT Filed Oct. 8, 1982, Ser. No. 503,143
Claims priority, application France, Oct. 9, 1981, 81 19104
Int. Cl.⁴ A61F 5/00; A43B 21/00
U.S. Cl. 36—110 10 Claims



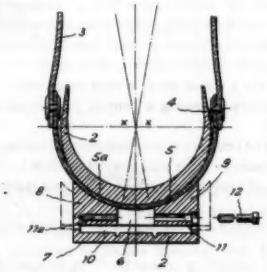
1. A shoe, especially for a patient having undergone a surgical operation on the fore-foot, comprising: an upper open at the front and adapted to wrap round a rear part of the foot while leaving the metatarsal heads of the foot free; and a compressible sole substantially thicker at the front than at the rear, arranged at and secured below the upper, and sized to also leave the metatarsal heads of the foot free, whereby the whole foot of the patient is maintained sloping and away from the ground during walking.

4,546,558

SKI BOOT

Sergio Perini, 3 Viale Metronio, Rome, Italy

Filed Dec. 5, 1983, Ser. No. 558,359
Claims priority, application Italy, Dec. 7, 1982, 36198/82[U]
Int. Cl.⁴ A43B 5/04
U.S. Cl. 36—120 7 Claims



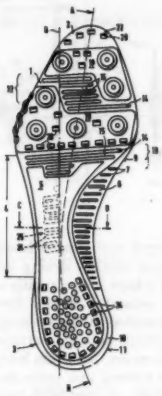
1. A ski boot having a stiff bootleg with an adjustable lateral inclination, said boot comprising: a fixed hull; a stiff bootleg pivotally linked to a substantially rigid, curved stirrup laterally encircling the hull and passing through it in the transverse direction within a hollow situated in proximity to a heel of the boot, so as to allow lateral inclinations of the bootleg in a transverse vertical plane with respect to the longitudinal axis of the foot of the user, and clamping means for locking the stirrup in the desired position relative to the hull to provide a desired transverse angular orientation between said bootleg and said hull.

4,546,559

ATHLETIC SHOE FOR TRACK AND FIELD USE

Armin A. Dassler, Herzogenaurach, Fed. Rep. of Germany, assignor to Puma-Sportschuhfabriken Rudolf Dassler KG, Fed. Rep. of Germany

Filed Aug. 16, 1983, Ser. No. 523,791
Claims priority, application Fed. Rep. of Germany, Sep. 11, 1982, 3233792
Int. Cl.⁴ A43B 5/06, 13/16
U.S. Cl. 36—129 27 Claims



1. An athletic shoe for track and field events of the type involving at least one of running and jumping, having a running sole made of a flexible plastic material continuing from the tip of the shoe to the heel and having profile projections that jut out of a running surface thereof, wherein the running sole, in an area of the longitudinal arch of the foot, is displaced toward the outside edge of the foot and is narrowed so that the running sole is located only under the part of the foot that engages the ground when stressed during running; the running sole is provided with a reinforcement plate that is adapted to the contour of the running sole, extends from the heel, along the narrowed part of the running sole, to at least approximately before the start of the ball of the foot and is fitted onto the running sole such that said reinforcement plate extends substantially to the outside edge of the running sole; and wherein the running sole, in the area of the longitudinal arch of the foot, is provided with a supporting wall that extends diagonally upwardly toward the inside of the foot and is shaped to substantially conform to the arch contour of the longitudinal arch of the foot.

4,546,560

SEAM PRESSER

Helen E. Granata, 14730 S. Kilpatrick - 2E, Midlothian, Ill. 60445

Filed Oct. 22, 1984, Ser. No. 663,332
Int. Cl.⁴ D06F 75/24, 75/30
U.S. Cl. 38—1 B 3 Claims

1. A seam presser for pressing a seam having a seam allowance of a given width defined by two pieces of fabric stitched together, comprising, an elongate handle with a front and rear end and including a bore therethrough, said handle including a circular flange at the front end having an end face with a plurality of circumferentially arranged raised portions, an electrical heating element fixed to the flange at the front end of said handle and including electrical conductors routed through said bore, a vented heat shield surrounding said heating element and fixed to the front end of said handle, said heating element having a flange at the end fixed to the handle abutting against said raised portions, said heat shield having a flange at

the end adjacent the handle, spacers disposed between the heat shield flange and the heating element flange, and means fastening said heat shield and heating element to said handle which extend through said heat shield flange, the spacers, and the heating element flange, whereby heat from the heating element is dissipated between the heat shield and the handle and said heat shield protects against contact between the heating element and fabric, a sole plate having a pointed leading end with

a flat undersurface for presing seams and connected to said heating element for thermally conducting heat away from said heating element, and sole plate having a width less than the given width of the seam allowance so that the sole plate edges stay within the seam allowance during pressing and being connected to said heating element so that the plane of said undersurface is angled with respect to the axial axis of said handle.

4,546,561

PICTURE VIEWER

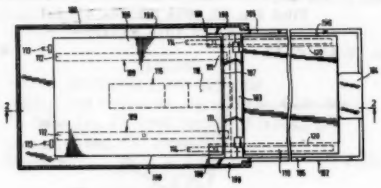
Peter Ackeret, Küsnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland

Filed Dec. 12, 1983, Ser. No. 560,384

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1982, 3246101

Int. Cl.⁴ G09F *11/30*

U.S. Cl. 40—513 **13 Claims**



1. A picture viewer comprising:

(a) a housing member adapted to accommodate a stack of pictures of substantially equal size, the housing member having a top wall provided with a viewing window, a bottom wall opposite the top wall, side walls, a rear end wall, and an open front end;

(b) a slider member adapted to be moved into and out of the open front end of the housing member parallel to the plane of the viewing window of the housing member;

(c) bias means mounted in the picture viewer and adapted to urge the topmost picture of a stack of pictures in the housing member against the viewing window of the housing member;

(d) picture exchange means comprising: (i) a separator bar adapted to move pictures in the stack of pictures out of the housing member when the slider is moved out of the housing member, and (ii) a retentive element adapted to engage a first picture in a stack of pictures in the housing member to retain the first picture in the housing member when the slider is moved out of the housing member, the first picture being at a first end of the stack of pictures, whereby, in use, when the slider member is moved out of the housing member, the first picture is separated from the stack of pictures and when the slider member is moved back into the housing member, the first picture is returned to a second end of the stack opposite to the first end; and

(e) alignment means for aligning the first picture that is separated from the stack of pictures with the remainder of the stack of pictures so that upon the return stroke of the slider member the first picture is returned to the stack of pictures without jamming of the first picture in the picture viewer.

4,546,562

ANIMATED TOY

Gregory A. Jones, 1940 Webb, Detroit, Mich. 48206

Filed Apr. 8, 1983, Ser. No. 483,096

Int. Cl.⁴ G09F *19/08;* **A63H** *13/00*

U.S. Cl. 40—591 **6 Claims**

1. In combination, an automobile having at least one window therein which may be raised and lowered and an animated toy including a body part on which a representation of the upper body portion of a runner is depicted including two substantially flat portions with juxtapositioned surfaces having the top and two sides secured together and having a bottom, axle structure including a U-shaped wire member with end portions secured to the body member with the legs of the U abutting the flat portions at the bottom thereof and the bight of the U extending transversely and a straw portion sleeved over the central part of the U-shaped wire member, a leg member having a plural leg portions thereon constructed to provide resistance to wind created by movement of the automobile mounted for rotation on the straw portion of the axle structure with leg portions of the leg member extending below the representation of a runner on the body member whereby on rotation of the leg member the illusion of the runner running is provided and support means secured to the body member and pinched between the window and the frame for the window with the window closed to hold the animated toy in spaced relation to the automobile while the automobile is in motion.

2. An animated toy, comprising a body member having a picture of the upper body of a runner thereon which body member is a sheet folded centrally to form two generally parallel, flat, juxtapositioned sheet portions with the fold at the top and with the sides of the sheet portions secured together whereby the bottom may be opened to place a leg member partially within the folded sheet from the bottom thereof, a leg member including a plurality of leg portions, means mounting the leg member for visible rotation on the body member in substantially the normal position for legs on the upper body portion of the runner pictured on the body member including a U-shaped wire secured to the body member at the bottom thereof with the bight of the U forming an axle for said leg member and the legs of the U abutting the inner surfaces of said sheet portions, and means whereby the leg member is caused to rotate by air passing the leg member to provide the illusion of the pictured runner running.

4,546,563

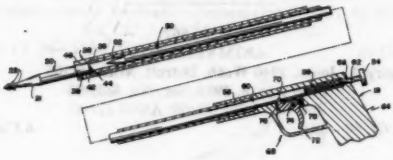
METHOD AND APPARATUS FOR KILLING EARTH-BURROWING INSECTS

Raymond D. Amburn, 8325 Riverland Dr., Riverland Apartment, Bldg. 6 #1, Sterling Heights, Mich. 48078

Continuation-in-part of Ser. No. 419,653, Sep. 20, 1982, abandoned. This application Feb. 27, 1984, Ser. No. 582,164

Int. Cl.[4] F41C *27/00*; **A01M** *1/00, 17/00*

U.S. Cl. 42—1 R **14 Claims**



1. Apparatus for killing earth-burrowing insects such as fire ants with an explosive shell, said apparatus comprising: a rigid, elongated, hollow barrel having first and second end portions; a hollow shell containing an explosive powder therein; and firing means for selectively exploding the shell, said barrel including holding means for selectively holding one end of said shell at said first end portion of said barrel and for permitting explosion of said shell by the firing mechanism exteriorly of the barrel, said shell including a tapered end end portion for burrowing through an ant mound and a cylindrical container portion having a hole therethrough for receiving the explosive powder.

4,546,564

RIFLED BORE CONSTRUCTION FOR A GUN BARREL

Anthony A'Costa, P.O. Box 5806 - 2216 7th Ave., C-301, Pueblo, Colo. 81003

Continuation of Ser. No. 372,867, Apr. 28, 1982, abandoned, which is a continuation-in-part of Ser. No. 131,318, Apr. 27, 1982, abandoned. This application Aug. 15, 1983, Ser. No. 516,230

Int. Cl.[4] F41C *21/08*

U.S. Cl. 42—76 R **5 Claims**

1. An improved two piece gun barrel including first and second gun barrel portions joined together to form one continuous gun barrel having a breech end and a muzzle end, said first and second gun barrel portions having a constant outer diameter extending from their joined terminus ends, said first gun barrel portion having a rifled bore portion of a given constant inside diameter extending from a point adjacent said breech end thereof terminating in a female end at a desired point from said breech end, said rifled portion including spiral lands and grooves of a constant diameter which extend longitudinally of said first gun barrel portion with the spiral in a desired direction, said female end of said first gun barrel portion including screw threads along a portion thereof, a first cylindrical portion inwardly of said threaded portion having a diameter which is less than said threaded portion and a chamfered sealing surface extending from said first cylindrical portion to said rifled portion of said first gun barrel portion, a second cylindrical portion that extends from said threaded portion toward a terminus of said first gun barrel portion, and a smooth chamfer area that extends from said second cylindrical portion to the outer cylindrical surface at the terminus of said first gun barrel, said second gun barrel portion having a smooth cylindrical bore of constant diameter extending from said muzzle end thereof terminating in a male end, said smooth cylindrical bore of said second gun barrel portion having a diameter not less than the diameter of said lands in said first gun barrel portion, said male end of said second gun barrel portion having an outer threaded portion, a third cylindrical portion outwardly of said threaded portion and a fourth cylindrical portion inwardly of said threaded portion, the diameter of said third cylindrical portion mating with said first cylindrical portion of said first gun barrel portion, said threaded portion of said male portion mates with said threaded portion of said female end of said first gun barrel portion and said fourth cylindrical portion mates with said second cylindrical portion of said female end of said first gun barrel portion, said male end of said second gun barrel portion includes an end that seals with said inner chamfer of said female end of said first gun barrel portion, and said second gun barrel portion includes a chamfer inwardly of said threaded portion that mates with said chamfer on the terminal end of said female end of said first gun barrel portion to form a seal, said threaded portions of said male and female ends of said first and second gun barrel portions having equally longitudinal sections of said threaded portions removed along the entire threaded portions with the depth of said removed longitudinal sections being greater than a depth of said threads on said threaded portions to form longitudinally interrupted threads whereby said male end of said second gun barrel portion can be inserted into said female end of said first gun barrel portion such that said threaded portions remaining subsequent to removal of said longitudinal sections will slide along said removed longitudinal sections of each respective gun barrel portion until the chamfered ends of each respective gun barrel portions contact each other and said second gun barrel portion is rotated in a direction opposite to the direction of the spiral of said grooves in said first gun barrel portion thereby securing said second gun barrel to said first gun barrel portion with said chamfered surfaces forming tight seals.

4,546,565

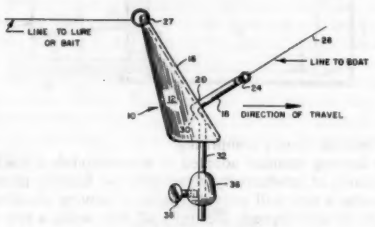
TROLL MASTER

Bruce D. Blevins, 416 Columbia Rd., Bristol, Tenn. 37620

Filed Jun. 10, 1983, Ser. No. 477,321

Int. Cl.[4] A01K *85/00*

U.S. Cl. 43—43.13 **8 Claims**



1. A troll line depresser comprising

a plate having two triangular wings interconnected along a spine,

a towing rod affixed to said spine and extending forward perpendicularly therefrom, said rod having a length approximately equal to half the distance along the spine from an upper end thereof to said rod,

a rearward portion of said towing rod forming a short segment lying against said spine and a long segment that is substantially vertical in use,

said wings being symmetrical about a plane defined by the axis of said rod and said spine,

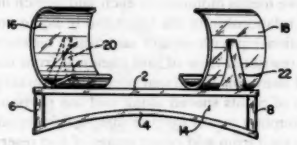
said wings having a dihedral angle therebetween, each wing being swept back from a plane perpendicular to said rod, so as to provide lateral stability when the depresser is towed through water.

4,546,566

WEARABLE FISHING ROD HOLDER

Russell J. Corrente, 1110 Cambria St., Portage, Pa. 15946

Filed Mar. 17, 1983, Ser. No. 476,260
Int. Cl.[4] A01H *91/10*
U.S. Cl. 43—21.2 **10 Claims**



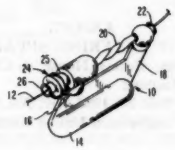
1. A wearable fishing rod holder comprising:
attachment means for securing said holder to the user,
a base member,
a pair of spaced rod receivers secured to said base member,
said rod receivers extending around an arc of about 160 to 270 degrees,
a first said rod receiver having a generally concave downwardly open configuration,
a second said rod receiver having a generally concave upwardly open configuration, whereby a rod may be supported with an upper rod surface engaged by one said rod receiver and a lower surface being engaged by the other said rod receiver,
said rod receivers being so spaced and proportioned as to permit a fly rod to be supported in said holder with an associated fly reel depending downwardly therefrom at or adjacent the lower end of said rod,
said attachment means having a securement member disposed on the opposite side of said base member from said rod receivers,
said securement member being secured in spaced relationship with respect to said base member to define a belt-receiving passageway therebetween,
said base member being substantially planar, and
said securement member being convex toward said base member.

4,546,567

FISHING LINE SINKER

Danny J. Bailey, 242 Walnut St., Fort Collins, Colo. 80524

Filed Jan. 17, 1984, Ser. No. 571,427
Int. Cl.[4] A01K *95/00*
U.S. Cl. 43—44.87 **7 Claims**



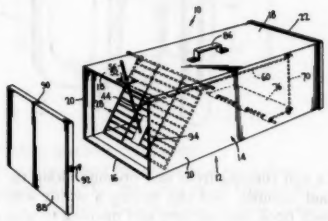
1. A sinker adapted for use on a fishing line and being adjustably positionable on said line, said sinker comprising:
(a) a weighted body having protruding first and second arm members, wherein said arm members include first and second openings, respectively;
(b) an elongated, resilient, stretchable tube member disposed between said openings, said tube member having an axial bore therethrough, wherein a portion of said bore has a variable internal diameter normally greater than the diameter of said fishing line to accommodate free sliding movement of said weighted body along said line when said tube is in untwisted condition and also less than the diameter of said line to frictionally clamp said weighted body to said line when said tube is twisted; and wherein one end of said tube member is secured at said first opening; and
(c) a knob member secured to the opposite end of said tube member;
wherein said tube member is stretched between said first and second openings in a manner such that said knob member is normally urged toward said second opening, and wherein said knob member is further adapted to be rotated in a manner such that said tube member becomes twisted and frictionally engages said fishing line so as to retain said sinker in desired position on said fishing line.

4,546,568

ALL-METAL LIVE TRAP

Edwin E. Seyler, Box 339, 403 S. Oak, Townsend, Mont. 59644

Filed Oct. 26, 1982, Ser. No. 436,807
Int. Cl.[4] A01M *23/16*
U.S. Cl. 43—61 **2 Claims**



1. An animal trap comprising a sheet metal housing in the form of a tubular body of rectangular cross-section and an end wall closing one end of said body, the other end of said body being open to permit entry of an animal, said housing being substantially imperforate to prevent accidental bites and scratches, a trap door for closing said open other end, said trap door being of a mesh construction and fully recessed within said body in a closed position of said trap door wherein a trapped animal may be seen and identified without endangering an observer, and control means normally holding said trap door in an open position and being movable when actuated to release said trap door, wherein said trap door is pivotally connected at an inner edge of said trap door to an upper part of said housing wherein when released said trap door drops to a downwardly and forwardly sloping closed position, and automatic latch means extending between said trap door and housing for locking said trap door in a lowered housing closing position, wherein said automatic latch means includes a rod pivotally connected at a lower end to said trap door and extending forwardly and upwardly through an opening in a top wall of said body, and cooperating latch means on said rod and said housing for locking said rod in a latch door closed and retaining position, wherein said cooperating latch means includes a roughened surface in the form of threads on said rod and a latch clip carried by said body top wall for automatic locking engagement with an aligned portion of said rod roughened surface in accordance with the closed position of said trap door as permitted by a trapped animal.

4,546,569

NON-TANGLING TROT-LINE SPOOLING APPARATUS

Joseph V. Thompson, Jr., Houston, Tex., assignor to E-Zee Company, Pearland, Tex.

Filed Nov. 10, 1983, Ser. No. 550,577
Int. Cl.[4] A01K *97/00*
U.S. Cl. 43—57.3 **12 Claims**

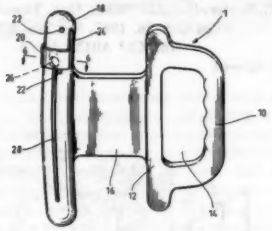
1. A non-tangling trot-line spooling apparatus for spooling up and storing a trot-line having a set-line with spaced apart

leaders attached thereto, each leader having a hook at one end, the apparatus comprising:

(a) a gripping portion positioned to one end of said apparatus, said portion containing an aperture proximal the end of the apparatus to permit the fingers of a hand to pass through the aperture and grasp a portion of the apparatus between the fingers and the palm of the hand, said gripping portion having a knuckle portion located on the knuckle side of a hand gripping the apparatus;

(b) a hollow tubular member positioned to the opposite end of said apparatus, said tubular member having,

(i) an opening proximal one end for permitting the curved portion of each hook which includes the barbed tip to pass into the interior cavity of said tubular member,



(ii) a slot running from said opening along the length of said member, said slot having a width which permits each hook inserted into said opening to pass down the slot, and

(iii) a means for closing said opening to prevent the escape of hooks through the opening once the trot-line has been spooled onto the apparatus; and

(c) a connecting member coupling said gripping element to said tubular element, said connecting element, said knuckle portion of said gripping portion, and said tubular element defining working surface of a spool area for receiving and retaining the trot-line set-line as the set-line is spooled around said connecting member so that the line, leaders, and hooks are secured to the apparatus in a non-tangling fashion.

4,546,570

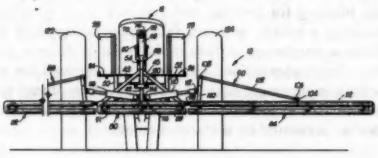
APPARATUS FOR APPLYING AGRICULTURAL CHEMICALS INCLUDING CONTACT TYPE HERBICIDES

Norman E. Schaeffer, R.R. #1, Forest City, Mo. 64451

Filed Dec. 6, 1982, Ser. No. 447,208

Int. Cl.[4] A01G *13/00*

U.S. Cl. 47—1.5 **1 Claim**



1. In apparatus for applying an agricultural chemical in liquid form to selected plants extending above the tops of a field crop:

reservoir means adapted for receiving a quantity of said chemical and having inlet means and outlet means;

an elongate, substantially rigid and non-deformable, tubular conduit member having inlet means and outlet means respectively adjacent opposite extremities thereof and having at least one substantially straight, substantially horizontal, elongate stretch provided with a plurality greater than two of restricted but continuously open orifice means in a top portion only thereof and disposed at substantially regularly spaced longitudinal intervals therealong;

elongate, substantially cylindrical, porous, liquid absorbent, sleeve means mounted on each said stretch in circumscribing relationship to the latter and in liquid communicating relationship with each of said orifice means of said stretch for restricted flow of said chemical from said member to said sleeve means on said stretch at a plurality greater than two of points spaced along said top portion of the latter;

first coupling means for providing a first liquid communication path from said outlet means of said reservoir means to said inlet means of said member;

second coupling means for providing a second liquid communication path from said outlet means of said member to said inlet means of said reservoir means;

liquid pump means interposed in series with said first path and having inlet means in liquid communication with said outlet means of said reservoir means and outlet means in liquid communication with said inlet means of said member;

drive means operably coupled with said pump means for operating the latter, said drive means being activated for continuously recirculating said chemical through said pump means, said conduit member, said second path, said reservoir means and said first path and for maintaining said chemical under a selected pressure in said one stretch of said conduit means during normal operation of said apparatus for application of said chemical to said selected plants; and

supporting means adapted for mounting said reservoir means, said member and said sleeve means associated therewith, said first and second coupling means, said pump means and said drive means on a mobile vehicle with said one stretch of said conduit member and said sleeve means thereon extending generally transversely to a normal direction of travel of said vehicle, said mounting means being adjustable for positioning said one stretch of said member and said sleeve means on the latter at a height for brushing engagement of said selected plants with said sleeve means on said one stretch when said vehicle is moved in said direction of travel thereof across a field where said selected plants are situated.

4,546,571

PLANT WATERING APPARATUS

Stephen J. Scrivens, Bosley House, 6 Church St., Ledbury, Herefordshire, England

Filed Feb. 24, 1983, Ser. No. 469,921

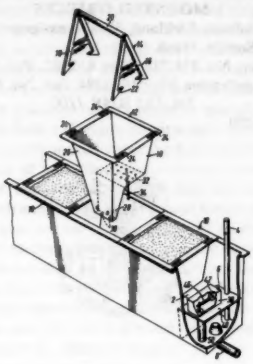
Claims priority, application United Kingdom, Feb. 25, 1982, 8205545

Int. Cl.[4] A01G *25/00*

U.S. Cl. 47—81 **8 Claims**

1. Plant watering apparatus comprising a trough incorporating a water reservoir, the trough terminating upwardly in upper edges and at least one plant container removably received within the trough and suspended on said upper edges at the top of the trough by means of an outwardly extending flange at the top of the container such that a downwardly extending integral portion of the container, which is of substantially smaller cross-section than the remainder of the container and is provided to be filled with a capillary medium when the container is planted, hangs down into the water reservoir to supply water to the plant within the container from the water reservoir by capillary action when the container is planted and installed within the trough, said at least

one container being provided with at least one leg in addition to the downwardly extending portion to enable the unit to be



stood upright on said downwardly extending portion and said at least one leg.

4,546,572

BELT GRINDING MACHINE

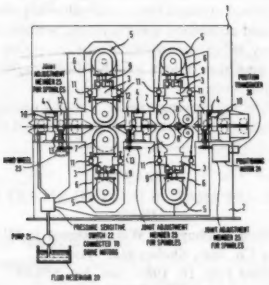
Kurt Fischer, Bad Münder, Fed. Rep. of Germany, assignor to Bison-Werke Bahre & Greten GmbH & Co. KG, Springe, Fed. Rep. of Germany

Filed Apr. 25, 1984, Ser. No. 603,727

Claims priority, application Fed. Rep. of Germany, May 3, 1983, 3316154

Int. Cl.[4] B24B *21/04*

U.S. Cl. 51—140 **18 Claims**



1. A belt grinding machine for continuous surface grinding of board having upper and lower surfaces, the machine having first and second longitudinal sides and comprising an upper housing part; a lower housing part; means for continuously feeding the board between said upper housing part and said lower housing part during grinding; fluidic lifting means for lifting said upper housing part relative to said lower housing part for adaptation to different board thicknesses; respective spacers provided at each of said first and second longitudinal sides between said upper housing part and said lower housing part for effecting a basic board thickness selection; at least one belt grinding unit mounted in at least one of said upper and lower housing parts; said at least one belt grinding unit having a respective endless grinding belt and guide means in the form of at least one of a contact roller and a pressure beam for guiding said endless belt over one of said upper lower surfaces; and support means disposed opposite to said guide means and engageable with the other one of said upper and lower surfaces; wherein a respective pressure fluid loaded and vertially steplessly adjustable clamping device is associated with each of said spacers for clamping said upper housing part to said lower housing part via said spacers, thereby defining the ground thickness of said board.

4,546,573

GRINDING MACHINE

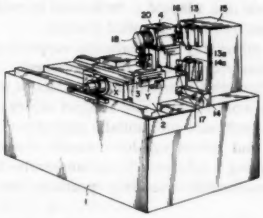
Kazuo Shiba, and Shigehiro Fuwa, both of Tokorozawa, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jul. 16, 1984, Ser. No. 631,228

Claims priority, application Japan, Jul. 25, 1983, 58-135464

Int. Cl.[4] B24B *49/12*

U.S. Cl. 51—165.72 **9 Claims**



1. A grinding machine comprising:

a grinding attachment for grinding a workpiece;

an optical detector for detecting an inclination and a difference of a reference position of said workpiece with respect to a reference position of the grinding machine;

an inclinable jig for holding said workpiece and capable of inclining the reference position of said workpiece;

moving means for mounting said inclinable jig thereon and capable of traveling between said optical detector and said grinding attachment;

a controlling member for providing a rotary force to said inclinable jig and rotating the same; and

a controlling device for sending a control signal to said controlling member and sending other control signals to said moving means and said grinding attachment;

said controlling device calculating a correction amount of the reference position of the workpiece according to the position information from said optical detector, providing the control signal to said controlling member in accordance with the calculated value to rotate and hold said inclinable jig, and traveling said moving means, whereby after the reference position of said workpiece is located and a surface to be ground with respect to the reference position of the workpiece is set, said moving means are traveled and said grinding attachment grinds the workpiece.

4,546,574

PRESS CLEANING APPARATUS

Raymond B. Blossick, Lancaster; Frank M. Bortzfield, Willow Street; Kenneth E. Brown; Joseph H. Herr, both of Lancaster, and Gerald L. Rannels, New Providence, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed May 3, 1984, Ser. No. 606,575

Int. Cl.[4] B24B *23/00*

U.S. Cl. 51—170 T **4 Claims**

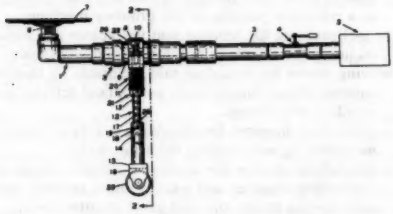
1. An air-operated, portable, manually manipulatable, stabilized apparatus adapted to be used between the upper and lower platens of a press to clean the lower surface of the upper platen, said apparatus comprising in combination

(a) an air motor housing having a longitudinal axis;

(b) an air motor within said housing;

(c) a first elongated, rigid, hollow body portion integral with and extending from one end of said housing along the longitudinal axis thereof;

(d) a second rigid hollow body portion integral with and extending from the other end of said housing;
(e) means located at a point on said first elongated body portion at the end thereof remote from the housing for controlling the amount of air supplied to the air motor;
(f) means for supplying pressurized air to the air motor;
(g) means on said second hollow body portion at the end thereof remote from the motor housing for supporting a shaft at right angles to the longitudinal axis of said housing;
(h) a shaft operably connected with said air motor and extending from the support means on said second hollow body portion;
(i) an abrasive disk mounted on the free end of said shaft, said shaft and said disk adapted to be rotated by said air motor when pressurized air is supplied thereto;
(j) means for adjustably and resiliently supporting the composite structure comprising the components of subparagraph (a) through (i) for movable contact of the abrasive disk with a work surface, said support means comprising
(1) a frame positioned substantially centrally of said motor housing and extending downwardly therefrom, said frame having a substantially rectangularly-shaped base with downwardly-extending portions at each end thereof;
(2) a roller operably mounted between said downwardly-



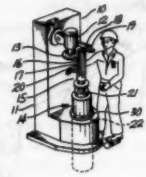
extending portions of the frame base, said roller extending substantially across the entire distance therebetween and downwardly there beyond;
(3) telescoping height-adjusting means mounted on and extending upwardly from said frame base;
(4) clamp means secured around said motor housing and mounted on the height-adjusting means adjacent the top portion thereof for slidable movement lengthwise thereon;
(5) means for holding said heightadjusting means at a selected height;
(6) spring means mounted on said height-adjusting means and in contact with said clamping means to exert pressure upwardly thereon;
(7) means on said height-adjusting means for supporting said spring means; and
(8) means on said height-adjusting means for limiting upward movement of the clamping means, whereby, the lower surface of the upper platen of a press may be cleaned by using said first elongated body portion extending from said motor housing to manually move the apparatus between the upper and lower platens of the press with the roller riding on the bottom platen and the abrasive disk moving along the lower surface of the upper platen and being held thereagainst with automatically adjusted pressure by the spring means on the height-adjusting members.

4,546,575

METHOD FOR PRECISION GRINDING OF END MOUNTED OBJECTS

Clarence R. Adams, Kirkland, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 374,722, May 4, 1982, Pat. No. 4,497,139.
This application May 18, 1984, Ser. No. 611,972
Int. Cl.⁴ B24B *1/00*
U.S. Cl. 51—288 **18 Claims**



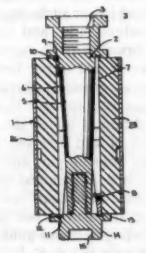
1. A method of dressing an object, comprising:
securing the object in a vertical position to one end of a vertically oriented support member having a longitudinal axis;
continuously supplying pressurized fluid to the support member to exert an upward force on the support member that is less than the combined weight of the support member and the object secured thereto by a predetermined amount to thereby counterbalance a portion of said combined weight;
while so counterbalancing said combined weight, exerting an additional upward force on the support member to move the support member and the object axially upwardly;
allowing the pressurized fluid being supplied to the support member to leak away from the support member, removing said additional upward force, and allowing the downward force of said combined weight alone, without the application of any other downward force, to move the support member and the object axially downwardly at a controlled rate; and
while the object is moving axially, holding dressing means in a fixed position to contact a side portion of the object.

4,546,576

POLISHING APPARATUS HAVING AN EXPANDABLE HEAD

Peter M. Dreiling, Sheboygan, Wis., assignor to Hi-Lite Polishing Machine Co. Inc., Sheboygan, Wis.

Filed Feb. 16, 1984, Ser. No. 580,687
Int. Cl.⁴ B24D *9/02*
U.S. Cl. 51—372 **3 Claims**



1. An apparatus for polishing a metal article, comprising a tapered mandrel to be connected to a rotatable power source, an annular expandable hub disposed around the mandrel and

having a tapered inner surface to complement the tapered mandrel, said hub having a plurality of longitudinally extending first slots each having an open first end disposed at a first end of the hub and terminating at a first base disposed in spaced relation to the second end of said hub, said hub also having a plurality of longitudinally extending second slots each having an open second end disposed at said second end of the hub and terminating at a second base disposed in spaced relation to the first end of the hub, a plurality of outwardly extending longitudinal ribs circularly spaced about the hub and formed as part of said hub, each of said ribs being disposed between a pair of adjacent first and second slots, a resilient sleeve disposed around the hub and having a plurality of longitudinally extending internal grooves to receive said ribs to thereby prevent relative rotation between the hub and the resilient sleeve, an abrasive band disposed on the outer surface of said sleeve, and means engageable with the outer end of said mandrel for drawing the tapered mandrel inwardly of said hub to thereby expand the hub and provide a firm driving connection between the mandrel and the abrasive band.

4,546,577

RIDGE TILE

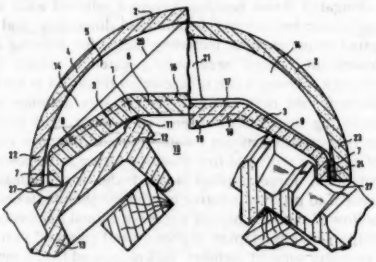
Max Gerhaher, Dr.Aicher-Str. 3, 383 Landau/Isar, and Franz Gerhaher, Stadtgraben 20, 844 Straubing, both of Fed. Rep. of Germany

Filed Jun. 2, 1983, Ser. No. 500,353

Claims priority, application Fed. Rep. of Germany, Jun. 4, 1982, 3221142

Int. Cl.⁴ E04B *7/00*

U.S. Cl. 52—57 **9 Claims**



1. A ridge tile comprising:

an elongated body having a forward end and a rearward end, said rearward end intended to be overlapped by a forward end of a similar ridge tile in a mating relationship,

a first portion defined by a flat surface located at an apex of the edge of said rearward end, and said first portion being spaced from an overlapping tile

opposing sides defined by said rearward end, said opposing sides being positionable adjacent to the forward end of the overlapping ridge tile,

second portions defined by flat surfaces located at the edge of said rearward end, said second portions being outwardly sloped from said first portion and extending towards said opposing sides, and

one end of each second portion being located adjacent to one of said opposing sides and adjacent to the forward end of the overlapping ridge tile and the other end of each second portion being located adjacent to one end of said first portion and spaced a substantial distance from the forward end of the overlapping ridge tile to thereby provide an increased ventilating air space between said rearward end and the forward end of the overlapping ridge tile.

4,546,578

TRANSPORTABLE HOLDING ASSEMBLY FOR RAPID ERECTION OF BUILDINGS

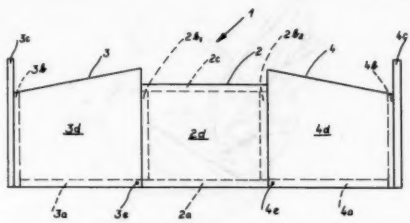
Georg Behrmann, Samstagstr. 2, Lauf, Fed. Rep. of Germany (8560)

Filed Aug. 15, 1984, Ser. No. 640,853

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1983, 3329492

Int. Cl.⁴ E04B *7/16;* **B60P** *3/32*

U.S. Cl. 52—67 **20 Claims**



1. A transportable container assembly for rapid erection of portable buildings comprising:

(a) a middle container having a generally box-like shape with longitudinal side walls, end walls, a floor and a roof, and two side containers each extending along one of the longitudinal sides of the middle container and having one longitudinal side wall, two end walls, a floor and a roof;

(b) means to pivotably connect each of the two side containers to the middle container so that each side container is pivotably movable through approximately 90°, between a swung-in transporting and storing position and a swung-out use position, about a pivot axis which passes approximately through the respective lower adjacent corners of the end walls of the middle and side containers;

(c) the first side container having an internal length greater than that of the middle container by an amount at least equal to the sum of the thicknesses of the two end-walls of said middle container;

(d) the second side container having an internal length greater than that of said first side container by an amount at least equal to the sum of the thicknesses of the two end walls of said first container;

(e) the internal width of the first side container being at least slightly greater than the height of said middle container, and the internal width of said second side container being greater than that of said first side container by an amount at least approximately equal to the sum of the thicknesses of the longitudinal side wall and roof of the first side container; and

(f) means for moving the roofs of the two respective side containers between a transporting and storing position parallel and adjacent to the respective longitudinal side walls and an installed roof position for use.

4,546,579

SEAT PLATE PROTECTING STRUCTURAL MEMBERS

Carlos S. Rionda, and Joaquin J. Palacio, both of Miami, Fla., assignors to Gang-Nail Systems, Inc., Miami, Fla.

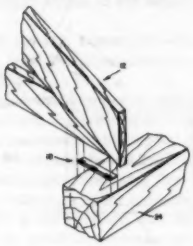
Filed Feb. 15, 1983, Ser. No. 466,531

Int. Cl.⁴ E04B *7/02*

U.S. Cl. 52—92 **6 Claims**

1. A method of protecting a wooden structural member such as a truss, joist or the like against structural damage as well as damage due to moisture and humidity which comprises: attaching to a wooden structural member having at least one vertical side wall portion and at least one horizontal lower surface a seat plate in the form of a flat sheet metal plate bent about a fold line to form an L-shaped member in cross-section having first and second planar plate portions lying in respec-

tive first and second planes intersecting one another and forming an included angle of approximately 90 degrees; said first plate portion having its width dimension in a direction perpendicular to said fold line substantially greater than the corresponding width dimension of said second plate portion; said second plate portion having a plurality of elongated nail-like teeth struck therefrom so as to project to one side thereof for embedment into the structural member and leaving a plurality



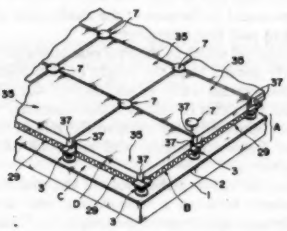
of elongated slots in said second plate portion, said teeth overlying said first plate portion and extending outwardly from said second plate portion in a direction generally perpendicular to said second plate portion, said seat plate being attached to said structural member so that the second plate portion abuts said vertical side wall portion of the structural member with the teeth thereof penetrating said structural member and with the first plate portion abutting said horizontal lower surface of the structural member.

4,546,580

HEAT INSULATION STRUCTURE FOR ROOFTOPS OF BUILDINGS

Kazunori Ueno, Kodaira, and Yohji Suizu, Koganei, both of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Jul. 12, 1983, Ser. No. 512,966
Int. Cl.⁴ E04D *15/00*
U.S. Cl. 52—126.1 **7 Claims**



1. A heat insulation structure for a building rooftop, said rooftop being coated with a waterproof layer, comprising:

a plurality of heat insulation panels;

a plurality of protective panels; and

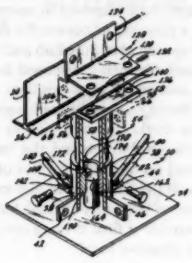
supporting means supported on said waterproof layer, for supporting said heat insulation panels so that a first air gap is formed between said waterproof layer and said insulation panels to form a first air layer, said supporting means also supporting said protective panels so that said protective panels are positioned above said insulation panels so that a second air layer is formed between said insulation panels and said protective panels, said insulation panels being arranged in a side by side relation to thereby form an insulation layer, and said protective panels being arranged in a side by side relation to thereby form a protective layer,

4,546,581

BUILDING STRUCTURE SUPPORT SYSTEM

Harold L. Gustafson, 11316 NE, 189th St., Battle Ground, Wash. 98604

Filed Aug. 10, 1984, Ser. No. 640,152
Int. Cl.⁴ E02D *27/48*
U.S. Cl. 52—169.9 **23 Claims**



1. A support member adapted for use in a support system for a building structure having a foundation formed of a plurality of spaced, parallel support beams wherein said support member is adapted to be positioned under one of a said beam, said support member comprising

a planar base having a vertically extending support member of a selected length and a predetermined external dimension and shape, said vertically extending support member including first coacting means located around the periphery thereof;

an elongated thrust member having a selected axial length and a selected external geometrical dimension, said elongated thrust member including means for defining a hollowed-out central area which extends axially therethrough forming a rim of a selected thickness at each end thereof, said hollowed-out central area defining means including means for forming an interior wall having a second coacting means located thereon which is capable of coacting with said first coacting means in response to a rotational force applied around the longitudinal axis thereof to produce relative movement therebetween, said hollowed-out area having a cross-sectional dimension and shape which is adapted to receive and pass said vertically extending support member, said elongated thrust member further including means for defining a driving means on the edge of one of said rims and in axial alignment with the hollowed-out central area, said elongated thrust member being positioned on said vertically extending support member with the rim of the elongated thrust member having the axially extending protruding members positioned remote from said planar base such that said first coacting means and said second coacting means coact with each other and are responsive to a rotational force applied therebetween to vary the distance between said elongated thrust member and said planar base;

a bottom member having a vertically extending portion formed of an internal geometrical dimension and shaped to receive and slide over said elongated thrust member mounted on said vertically extending support member, said bottom member including at least one pair of aligned base tabs positioned adjacent the planar base and one on each side of the vertically extending portion positioned adjacent the planar base;

an elongated sleeve member having an elongated central opening extending therethrough forming rims at each end thereof, one of which includes means defining a driving means engaging means adapted to receive said driving means and wherein the internal geometrical dimension thereof is substantially equal to the predetermined selected external dimension of said vertically extending

support member and the external geometrical dimension thereof is of a shape and dimension to permit said one end of the sleeve member having said driving means engaging means inserted into and transported through said vertically extending portion of the bottom member wherein the rim thereof is brought into engagement with the rim of said elongated thrust member and said slot receives said protruding member;

a top member having a top stabilizing plate and an extended lower portion formed of an internal geometrical dimension and shape to receive and slide over the other end of said sleeve member permitting the other rim to slide within said extended lower portion of said top member into engagement with said top stabilizing plate, said top member including a gripping means adapted to be fixedly attached to said top stabilizing plate and to one of said beams, said top stabilizing plate having at least one pair of aligned top tabs positioned one on each side of the lower extended portion of the top member and positioned in spaced parallel alignment with said at least one pair of base tabs;

at least two strut stabilizing rods each having one end extending from at least one of a selected one of the top tabs and a selected one of the bottom tabs; and

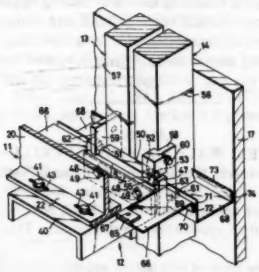
means for fixedly connecting said one of said strut stabilizing rods to at least one of said selected tabs and a selected bottom tab.

4,546,582

UNIT CURTAIN WALL

Karl Gartner, Gundelfingen, Fed. Rep. of Germany, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jul. 26, 1983, Ser. No. 517,505
Claims priority, application Japan, Aug. 2, 1982, 57-133768
Int. Cl.⁴ E04H *1/00*
U.S. Cl. 52—235 **7 Claims**



1. A unit curtain wall for a building frame, said wall comprising:

(a) a plurality of curtain wall units;

(b) a pair of brackets attached to horizontally adjacent edges of each pair of adjacent curtain wall units; and

(c) a fastener adapted to be adjustably mounted on the building frame and having a slot receiving one of said brackets and a movable bearing element supporting the other bracket for allowing the latter to move in a direction substantially parallel to said curtain wall units.

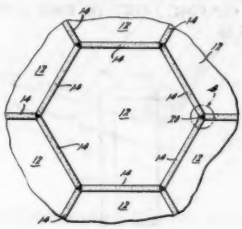
4,546,583

MODULAR BUILDING CONSTRUCTION SYSTEM

Gary Hussar, 20500 Kaiser Rd., Gregory, Mich. 48137

Filed Dec. 5, 1983, Ser. No. 558,377
Int. Cl.⁴ E04H *9/06*
U.S. Cl. 52—236.1 **8 Claims**

1. A modular building construction system comprising a plurality of hexagonally shaped floor members adjacently laid in an interlocking relationship, a plurality of hexagonally shaped ceiling members, a plurality of rectangularly shaped wall members which have a length corresponding to one of the hexagonal sides of said floor members, said wall members being placed on the perimeters of said floor members to support the perimeters of said ceiling members, and a plurality of U-shaped rods embedded in the sides of said hexagonal floor and ceiling members and the vertical sides of said wall members so that a loop of said U-shaped rods is exposed, said loops serving to tie adjacent wall members and adjacent floor or



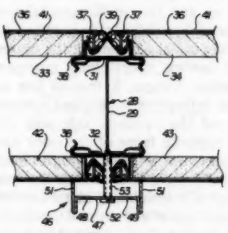
ceiling members together by inserting a bar through the exposed loops that overlap when two or more wall members, or two floor or ceiling members, are abutted, wherein a longitudinal space is formed between said abutting vertical sides of said wall members and between said abutting sides of said ceiling or floor members, said longitudinal space being filled with grout after said bar is inserted through said overlapped loops, whereby horizontal forces applied to said hexagonally shaped floor or ceiling members are dispersed into the various lines of connection between said hexagonal floor or ceiling members.

4,546,584

WALL PANEL SYSTEM PROVIDING RESILIENT JOINTS

David F. Mieyal, Strongsville, and Peter Reynard, Brunswick, both of Ohio, assignors to Donn Incorporated, Westlake, Ohio

Filed Jul. 11, 1983, Ser. No. 512,242
Int. Cl.⁴ E04B *2/56*
U.S. Cl. 52—281 **14 Claims**



1. A surface structure for rooms and the like, comprising support framing, a plurality of panels mounted on said support framing in edgewise alignment to provide closed joints therebetween, and resilient means positioned along said joint, said panels providing a flexible surface material extending along the exposed surface thereof and into said resilient means, said resilient means biasing said flexible surface material of adjacent panels into surface-to-surface contact to provide said closed joint between said panels, said resilient means permitting localized lateral separation of said flexible surface material along said joints when a separate member is inserted through said joint and causes said flexible material to establish said surface-to-surface contact when a separate member is removed from said joints, tubular sheath means being provided to separate

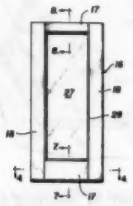
said flexible surface material along said joint, said sheath means being adapted to permit insertion of a fastener through said joint into said support framing without damaging said flexible surface material.

4,546,585

DOOR PANEL AND METHOD OF MAKING

Bernard C. Governale, Duluth, Ga., assignor to Peachtree Doors, Inc., Norcross, Ga.

Filed Aug. 2, 1983, Ser. No. 519,504
Int. Cl.⁴ E04C *1/00, 2/00*; E06B *3/70*
U.S. Cl. 52—309.11 **2 Claims**



1. A door panel or the like comprising top and bottom horizontal rail simulating metal sections on opposite faces of the door panel and opposite side vertical stile simulating metal sections on opposite faces of the door panel, the rail simulating metal sections having opposite end integral right angular flanges which extend inwardly from opposite faces of the door panel, the stile simulating metal sections having interior side integral right angular flanges which extend inwardly of said opposite faces of the door panel in side-by-side abutting relationship with the flanges of the rail simulating metal sections, the flanges of the rail and stile simulating metal sections being mechanically connected by swedging to form a sufficiently secure connection between the rail and stile simulating metal sections on the opposite faces of the door panel to enable completion of the construction of the door panel without separation of the rail and stile simulating metal sections, the rail and stile simulating metal sections on the opposite faces of the door panel also having integral longitudinal flanges at least along their exterior longitudinal edges and extending inwardly of such edges, top and bottom horizontal wooden rails and opposite side vertical wooden rails installed between the rail and stile simulating metal sections on the opposite faces of the door panel and having interlocking engagement with said integral longitudinal flanges, a framed lite assembly in the rectangular space defined by the top and bottom rail simulating metal sections and the opposite side stile simulating metal sections on the opposite faces of the door panel and having interlocking engagement with said longitudinal flanges, and a core of substantially rigid foam filling the interior space between the rail and stile simulating metal sections on the opposite faces of the door panel and around the framed lite assembly and between the latter and said top and bottom horizontal and opposite side vertical wooden rails, said core permanently and securely bonding all of the metal sections, wooden rails and framed lite assembly in unitized relationship.

4,546,586

SNAP-ON FASTENING DEVICE AND CAP ASSEMBLY FOR SEAMED PANELS

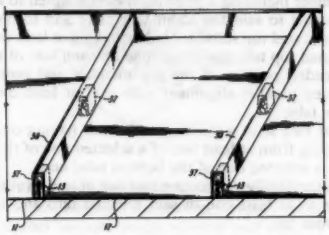
Gary A. Knudson, 17356 W. 57th Ave., Golden, Colo. 80401

Filed Apr. 11, 1983, Ser. No. 483,720
Int. Cl.⁴ E04C *1/34*
U.S. Cl. 52—469 **16 Claims**

1. A fastening device for securing a cap in the form of an inverted U-shaped member with a pair of opposed inturned end flanges to the exterior of a closed seam connecting panels side by side in which an edge portion of one panel is folded over an edge portion of the other panel and forms a laterally protruding overhanging surface portion comprising:

a body having a bight portion and a pair of opposed, resiliently yieldable legs extending from opposite ends of said bight portion and spaced from one another with a slot therebetween and with an entrance opening opposite said bight portion,

said legs having inside wall surface portions sized and shaped in relation to the size and shape of the seam so that, upon the forcible insertion of said body to a leg-straddling position over said seam, the legs spread apart and the resiliency of said legs applies retaining forces at several



contact points vertically of said seam to firmly secure said body thereto,

said body having an inside projection providing a locking surface portion facing said bight portion which will bear against the laterally protruding overhanging surface portion of the seam after said insertion to lock said body against forces tending to pull said body upwardly from the seam,

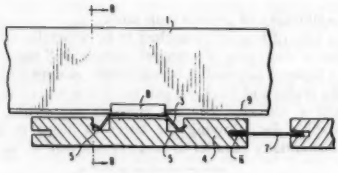
said body having retaining means including opposed retainer portions under which both opposed end flanges of the cap extend, the cap being disposed in a covering position on said fastening device to hold the cap against forces tending to remove the cap from said fastening device.

4,546,587

SYSTEM WALL OR SYSTEM CEILING

Theodorus W. Mosch, Kanaalkade 66, t'Zand, Netherlands

Continuation of Ser. No. 134,810, Mar. 28, 1980, Pat. No. 4,356,677. This application Nov. 2, 1982, Ser. No. 438,567
Claims priority, application Netherlands, Dec. 27, 1979, 7909311
The portion of the term of this patent subsequent to Nov. 2, 1999, has been disclaimed.
Int. Cl.⁴ E04B *5/57*
U.S. Cl. 52—489 **9 Claims**



1. Apparatus for attaching deformable slabs to structural girders to form walls or ceilings, said apparatus comprising:

a plurality of separate slabs each defined in part by generally parallel substantially planar surfaces; each slab having a pair of spaced, parallel, oppositely facing walls extending in length along the surface thereof which confronts said structural girders; said walls extending in depth from said

girder-confronting surface toward the opposite surface of said slab and terminating at a bottom wall;

a plurality of spaced clamping members, each of said members have a first means which engages said structural girders, and a second means which engages said slabs;

said first means having a pair of adjacently disposed and deformable fastening lips which are integrally joined to one another by a substantially planar base portion extending therebetween, said deformable fastening lips being adapted to be deformed around said structural girder on either side thereof to secure said clamping member to said girder; and

said second means defining a pair of oppositely angled clamping feet, each of said angled clamping feet extending outwardly from said substantially planar base portion, said pair of angled clamping feet being spaced apart from one another to span said predetermined distance between said oppositely facing walls, each of said angled clamping feet having a first portion joined to said planar base portion and inclined over a substantial first portion of its length both toward said bottom wall and toward the associated one of said pair of oppositely facing walls, each of said angled clamping feet having a second, oppositely inclined portion forming an extension of said first portion that angles away from said bottom wall having at its free end means for penetrating and into the respective one of said oppositely facing walls,

whereby slight pressure against each slab in the direction of the confronting structural girder is sufficient to engage said second inclined portions with said oppositely facing walls of said slab to thereby secure said slab to said clamping feet.

4,546,588

SECURING PANELS TO A SUBSTANTIALLY FLAT OR CONVEX SURFACE

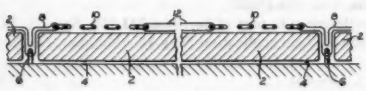
Joseph A. McWilliams, Droitwich, and John T. Hughes, Worcester, both of England, assignors to Micropore International Limited, Droitwich, England

Filed Mar. 21, 1983, Ser. No. 477,029

Claims priority, application United Kingdom, Mar. 23, 1982, 8208466

Int. Cl.⁴ E04B *1/38*

U.S. Cl. 52—506 **10 Claims**



1. In combination with a substantially flat or convex surface and at least one panel to be secured to said surface, an assembly for securing said at least one panel to said surface, the assembly comprising:

a plurality of hooks secured to the surface and positioned such that one of said hooks is disposed at opposite ends of said at least one panel, each of said hooks being dimensioned such that it does not protrude above the level of the outer surface of said at least one panel;

a band of fabric material attached to each of said hooks by means of a loop provided substantially at the mid-point of said band, said band further having a loop formed at each end thereof; and

spring means extending over the outer surface of said at least one panel between the loops at adjacent ends of said bands attached to said hooks at said opposite ends of said at least one panel so as to secure said at least one panel to the flat or convex surface.

4,546,589

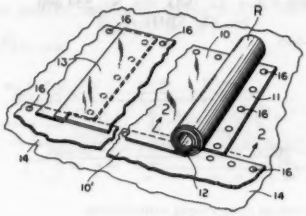
SINGLE-PLY SEALED MEMBRANE ROOFING SYSTEM

Richard N. Seaman, Millersburg, Ohio, assignor to Seaman Corporation, Millersburg, Ohio

Filed Apr. 20, 1981, Ser. No. 255,543

Int. Cl.⁴ E04D *5/06, 5/14, 19/08*

U.S. Cl. 52—518 **22 Claims**



1. The method of laying a single-ply sealed fiber-reinforced membrane covering over a roof deck comprising, providing rolls of membrane strips having transverse flaps of membrane substantially coextensive of width to said strips, one transverse edge portion of each flap being secured to the undersurface of said strips at longitudinal intervals, unrolling the strips successively in parallel side-by-side positions on the deck with their marginal side edge portions contiguous, mechanically fastening successive flaps of each strip at transverse intervals to the deck, mechanically fastening at least one marginal edge portion of each strip at longitudinal intervals to the deck, and bonding the marginal side edge portions of the strips together.

4,546,590

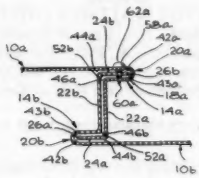
PARTITION WALL SYSTEM AND COMPONENTS THEREFOR

Harry E. Finch, 5273 Vista del Sol, and Geza J. Szayer, 5335 Canterbury St., both of Cypress, Calif. 90630

Filed Aug. 4, 1982, Ser. No. 405,193

Int. Cl.⁴ E04D *1/00*

U.S. Cl. 52—520 **23 Claims**



1. A plurality of like panels assembled in interlocking relationship to form a partition wall, each panel comprising:

(a) a generally rectangular planar central body, and

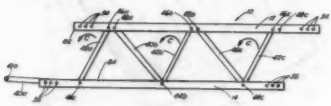
(b) a pair of selectively shaped connector means offset from the plane of the body and extending in the same direction therefrom along opposite edges of the body and integral therewith,

(c) each of said connector means including a female element adjacent an edge of the body and a male element spaced from the female element by a stop element which is generally perpendicular to the body, both the male and female elements facing the respective male and female elements of the other connector means of said panel,

(d) the stop element spacing the male element from the female element such that said female and male elements matingly and releasably engage respective male and female elements of a like panel which is inverted relative to the first-mentioned panel and joined thereto with the connector means interlocking, with the stop elements of

the adjacent connector means of the two panels abutting each other during such mating engagement;
and further including means for releasably fastening the interlocking connector means together.

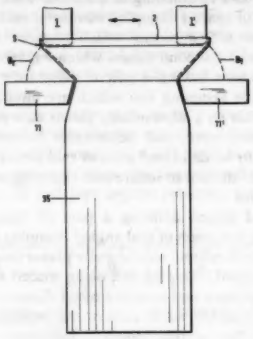
4,546,591
TRUSS SYSTEM AND COMPONENTS THEREOF
Thomas G. Beltz, R.D. #3, Box 22, Lehighton, Pa. 18235
Filed Nov. 23, 1983, Ser. No. 554,690
Int. Cl.⁴ E04H *12/18*
U.S. Cl. 52—645 **19 Claims**

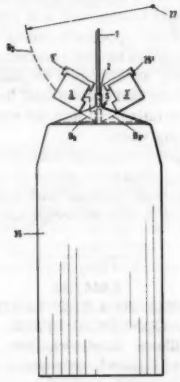


1. A truss system component comprising:
a. upper and lower chord members;
b. a plurality of first strut members fixedly and pivotally attached to and extending between said chord members for maintaining said chord members in substantially vertically spaced apart relationship, said upper and lower chord members providing means for pivotally connecting said first strut members thereto at substantially equally spaced first points along said upper chord member and substantially equally spaced second points along said lower chord member; and
c. a plurality of second strut members pivotally attached to and extending between said chord members for maintaining said chord members in substantially vertically spaced apart relationship, each of said second strut members being at its lower end fixedly and pivotally connected to one of said first strut members at each of said second points along said lower chord member and at its other other end being removably and pivotally connected to said upper chord member at substantially equally spaced third points therealong, each of said third points being substantially equally spaced from its adjacent first point.

4,546,592
APPARATUS FOR SEALING A LIQUID PACK
Wilhelm Reil, Bensheim, Fed. Rep. of Germany, assignor to Tetra Pak Developement S.A., Pully, Switzerland
Filed Feb. 4, 1983, Ser. No. 463,722
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1982, 324773
Int. Cl.⁴ B65B *51/14, 7/06*
U.S. Cl. 53—373 **10 Claims**

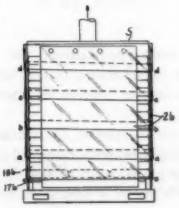
1. Apparatus for sealing the top of an open-ended paperboard container coated with plastic on at least one surface with a single elongated seam strip that extends across the middle of the top of the container, comprising a pair of flat and relatively thin fingers having rounded corners with said fingers extending along an axis, means for supporting a container in a position with its open end facing said fingers and the axis of the fingers extending in a plane perpendicular to the top edge of the open end of the container, means for moving the fingers in said plane perpendicular to the edge and into the top of the container a given distance, cam means for simultaneously moving the fingers apart as they are inserted into the container to stretch the edges of the open end of the container into an elongated opening consisting of two closely spaced edges extending across the middle of top of the container, a pair of welding jaws mounted on opposite sides of the fingers and the elongated opening for pivoting movement about an axis parallel to said elongated opening, and means for pivotally moving the jaws synchronously with the downward and outward movement of the fingers toward each other to engage the outer side of the two closely spaced edges of the elongated opening, to strip them off the fingers while the fingers are held stationary and hold the container in its stretched condition and to seal them together into a single elongated seam strip having two





triangular flaps extending in one plane on either side of the container.

4,546,593
PACKAGING
Ian M. Lasscock, 334 Henley Beach Rd., Lockleys, South Australia, Australia (5032)
Continuation-in-part of Ser. No. 941,860, Sep. 13, 1978, abandoned. This application May 15, 1980, Ser. No. 149,999
Int. Cl.⁴ B65B *35/50, 53/00, 53/02*
U.S. Cl. 53—441 **13 Claims**



1. The method of forming and holding a stack of bags where each of the bags is of similar size and shape and is other wise of a type and include material therein of a type wherewith such bags in a stack with substantially vertical sides and located in adjacent relationship with other of the bags to form a row, and in a crossing relationship to form an interleaved row upon row relationship that will be effective to force bags located at a lower portion of a stack and at a side of the stack, out to the

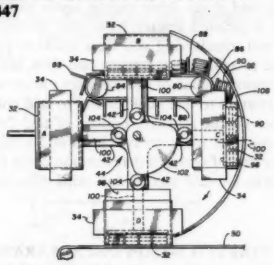
said side of the stack reducing stability of the stack and alignment of the sides of the stack, the method according to this invention being characterized by including the steps of (a) positioning a base pallet between vertically extending leaves located in adjacent relationship to each of four sides of the base pallet, (b) placing bags of said type on said base pallet in a manner whereby to form a stack constituted by the bags being in adjacent relationship with other bags to form a row, and in a crossing relationship to form an interleaved row upon row relationship, and further whereby at least the bags in the lower rows are confined by the said leaves, (c) locating and tightening a sleeve that extends around the stack including the leaves, (d) and withdrawing the leaves from between the sleeve and the stack to leave the stack tightly held by the sleeve.

4,546,594

MACHINE AND METHOD FOR LOADING CARTONS WITH IRREGULARLY SHAPED INDIVIDUAL ARTICLES

John M. Mohaupt, Blaine, Minn., assignor to Delkor Industries, Inc., Minneapolis, Minn.

Filed Dec. 27, 1983, Ser. No. 565,357
Int. Cl.[4] B65B *35/50, 35/56, 5/06*
U.S. Cl. 53—447 **11 Claims**



1. Apparatus for assembling a carton load of individual irregularly shaped products and loading them into an opened carton, comprising, in combination:

a. input conveyor means for transporting individual packages at a random flow rate to a collection point;

b. collating means located adjacent the end of the conveyor means at the collection point for receiving individual packages from the conveyor means, the collating means including at least one chamber constructed and arranged for receiving a partial carton load of a predetermined number of packages from the conveyor means, the collating means also including means for indexing the chamber and its partial carton load to an intermediate accumulating location;

c. collecting means operatively coupled to the collating means for receiving plural partial carton loads from the chambers of the second means at the intermediate accumulating location and for assembling a predetermined number of partial carton loads from successive chambers of the collating means at a staging area of the collecting means thereby to form a completed carton load of packages;

d. pusher means for moving the complete carton load of packages from the staging area of the collecting means onto a loading platform positioned adjacent thereto;

e. carton feed means for positioning an inverted opened carton above the loading platform;

f. actuator means coupled to the loading platform for moving the carton load of packages into the opened carton; and

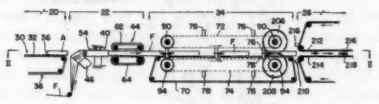
g. pivotal means constructed and arranged for inverting the loaded carton and its contents and depositing them in an output location.

4,546,595

METHOD AND APPARATUS FOR PACKAGING ARTICLES OF VARIOUS SIZES WITH A CONTINUOUS LENGTH OF HEAT SEALABLE FILM

Masaru Yasumune, Mihara; Junsaku Yamada, and Sumiaki Kurokawa, both of Onomichi, all of Japan, assignors to Kabushiki Kaisha Furukawa Seisakusho, Tokyo and Furukawa Kogyo Kabushiki Kaisha, Hiroshima, both of, Japan

Filed Jun. 26, 1984, Ser. No. 624,715
Claims priority, application Japan, Jun. 30, 1983, 58-119878
Int. Cl.[4] B65B *9/06*
U.S. Cl. 53—450 **19 Claims**



1. A method of packaging articles of various sizes with a continuous length of heat sealable film, which method comprises:

(a) continuously folding into approximately tubular shape the length of heat sealable film being fed longitudinally at a speed selected in accordance with the size of the articles to be packaged;

(b) successively introducing the articles into the film being folded, at a constant rate regardless of the selected speed at which the film is being fed, there being constant longitudinal spacings between the articles received in the folded film;

(c) heat sealing the side edges of the folded film over the successive articles received therein;

(d) transferring the side sealed film, together with the articles contained therein, onto a linear track for transportation thereon at a preassigned speed, the selected speed at which the film is fed while being folded and receiving the articles being determined in accordance with the preassigned speed of transportation of the article-containing film along the linear track;

(e) engaging the side sealed film, at points intermediate the articles contained therein, by an endless row of end sealing means at an entrance end of the linear track, the end sealing means being movable along the linear track at the preassigned speed;

(f) cutting off the side sealed film at a point immediately behind each end sealing means approximately concurrently with the engagement thereof by the end sealing means; and

(g) heat sealing one end of each severed piece of film, having one article received therein, by the end sealing means traveling in engagement therewith along the linear track.

4,546,596

METHOD OF AND APPARATUS FOR FORMING, FILLING AND SEALING PACKAGES

Dale M. Cherney, Howards Grove, Wis., assignor to Hayssen Manufacturing Company, Sheboygan, Wis.

Filed May 8, 1984, Ser. No. 608,184
Int. Cl.[4] B65B *51/14, 51/30, 57/00*
U.S. Cl. 53—451 **7 Claims**

1. The method of controlling packaging machinery which forms containers of flexible packaging material through cyclical operations, comprising the steps of:

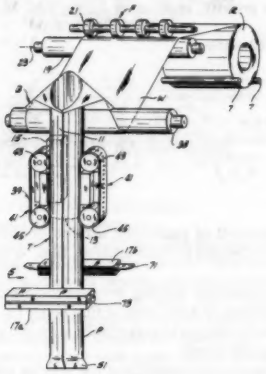
moving sealing members between an open position out of engagement with the packaging material and a closed position engaging the packaging material so as to produce a seal therein;

monitoring whether or not the sealing members have moved to the closed position from the open position;

comparing the position of closure of the sealing members, with a predetermined position within the cycle;

continuing movement of the sealing members toward the closed position as long as the position in the cycle is prior to the predetermined position, otherwise inhibiting further movement of the sealing members toward the closed position;

sensing movement of the sealing members into the closed position;



noting the position of the machine cycle at which the sealing members reach the closed position; and

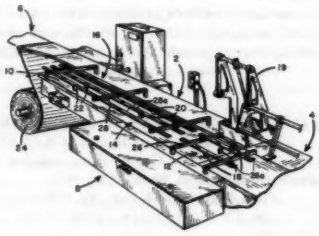
adjusting the predetermined position in the machine cycle prior to which the next subsequent movement of the sealing members from open to closed positions must be initiated and completed to prevent inhibiting of further movement of the sealing members toward the closed position, said adjustment being based on the previously noted position with respect to the immediate prior machine cycle.

4,546,597

TRANSFER ASSEMBLY FOR LITERATURE WRAPPING EQUIPMENT

Stanley D. Denker, New Richmond, Wis., assignor to Doboy Packaging Machinery, Inc., New Richmond, Wis.

Filed Oct. 5, 1983, Ser. No. 539,106
Int. Cl.[4] B65B *9/06, 35/44, 35/50*
U.S. Cl. 53—540 **7 Claims**



1. Apparatus for preparing a plurality of pieces of printed matter for mailing comprising in combination:

collating means for sequentially assembling into final stacks for mailing a plurality of different loose pieces of printed matter obtained from a plurality of individual stacks, each of said individual stacks containing a plurality of identical pieces of literature, each of said final stacks for mailing containing one piece from each of individual stacks, said final stacks being discharged from said collating means on an intermittent basis;

film wrapping means having a continuous web of plastic film containing printed matter thereon, film forming means for converting said web of film into a continuous tube of film wherein said final stacks of literature are to be deposited, and means for sealing and cutting said tube for producing individually film wrapped packages for mailing on a continuous basis; and

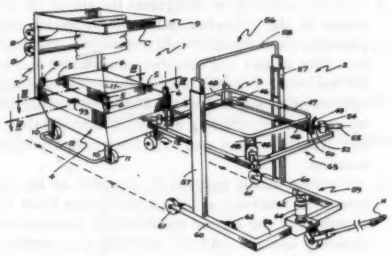
transfer means coupling said collating means to said film wrapping means, said transfer means having an elongated frame having parallel spaced apart side members, a first drive region chain containing a plurality of first pushing members and coupled to said collator by a first selectively actuable clutch, said first drive region chain being operable at a first transfer rate for conveying said collated materials, a second drive region chain having a plurality of second pushing members thereon coupled to said collator by said first clutch and operable at a second transfer rate, said second drive region chain including a second clutch, and a third drive region chain having a plurality of third pushing members and coupled to said second drive region chain and to said film wrapping means and being operable at a third transfer rate and including a third clutch, said third drive region chain receiving the final stacks of printed matter from said second drive region chain and transferring said final stacks at said third transfer rate to said film wrapper, said first, second and third drive region chains of said transfer means being synchronized relative to one another and to said collator and film wrapper via the selective control of said first, second and third clutches so as to synchronize an intermittent first transfer rate of said first drive region chain to a continuous rate drive for said second and third drive region chains.

4,546,598

STRETCH WRAPPING APPARATUS

Ladislav S. Karpisek, 86 Woodfield Boulevarde, Caringbah, New South Wales, Australia

Filed Apr. 13, 1983, Ser. No. 484,476
Claims priority, application Australia, Apr. 23, 1982, PF3728
Int. Cl.[4] B65B *53/00*
U.S. Cl. 53—556 **6 Claims**



1. Stretch wrapping apparatus comprising a first rectangular frame (**63**), a second rectangular, expandable and contractable frame (**3**), a holder (**48,49**) for a puckered band of plastic film at each corner of the second frame (**3**), each holder comprising a pair of spaced band support legs (**48**) fixed at their upper ends to said second frame (**3**), a puckering plate (**49**) to which the lower ends of each of said support legs (**48**) are fixed, said puckering plates (**49**) lying parallel to said support legs , said support legs and said puckering plates disposed in planes at right aggles to the plane occupied by said second frame (**3**), four jack screw assemblies (**52-55**) fixed to said first frame (**63**) to expand and contract said second frame (**3**), said jack screws (**52**) of the jack screw assemblies respectively fixed to said

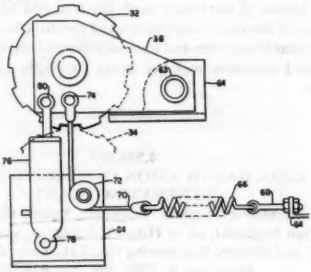
puckering plates (49) of said holders and disposed in a common plane parallel to the plane occupied by said second frame (3), four drive shafts (45) extending one from each jack screw assembly at right angles to the axes of said jack screws (52), a first support means (4), four drive heads (6) rotatably mounted on the first support means (4) engageable by said drive shafts (45), first drive means (34-43) on the first support means (4) to rotate the four drive heads (6), a second support means (26), elevating means (screws 30) connecting said first and second support means whereby the second support means is raisable and lowerable relative to the first support means, four puckering assemblies (belts 5 and support pulleys) mounted on the second support means (26), a puckering belt (5) on each puckering assembly extending between a pair of said band support legs (48) and bearing on a puckering plate (49), second drive means (14-18) on said second support means to simultaneously drive all of said puckering belts (5) and said elevating means (screws 30).

4,546,599

ROLL OPENER FOR A MOWER CONDITIONER

George B. Cicci, Burr Ridge, and Erik J. Guldberg, Downers Grove, both of Ill., assignors to The Paul Revere Corporation, Coldwater, Ohio

Filed Nov. 5, 1984, Ser. No. 668,003
Int. Cl.[4] A01D *82/00*
U.S. Cl. 56—16.4 4 Claims



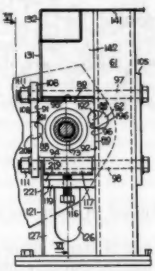
1. A crop harvesting and conditioning machine comprising:
a wheel supported main carrying frame;
a laterally extending crop harvesting header mounted to said main carrying frame by pivotal linkage including upper and lower swing links permitting movement of said header between a lower operating position and a raised transport position by means of a first hydraulic lifting means;
crop cutting apparatus mounted on the forward lower portion of the header for severing the standing crop material;
upper and lower transversely extending crop conditioning rolls rotatably mounted to said header rearwardly of said cutting apparatus, said lower conditioning roll being mounted on a fixed axis and said upper conditioning roll being mounted at each end to lever arms pivotally mounted to said header for relative swinging movement of the upper roll toward and away from said lower roll;
a second hydraulic lifting means having first and second hydraulic roll lift cylinders for lifting the upper crop conditioning roll;
crop catching and conveying means for delivering the crop cuttings laterally in a rearward direction away from said crop cutting apparatus and into the nip of said upper and lower conditioning rolls;
a source of hydraulic fluid pressure for supplying hydraulic fluid in parallel to said first and second hydraulic lift means;
spring tension means connected to each of said lever arms for biasing said upper roll to an operating position closely adjacent said lower roll;
said spring tension means further for sequencing said first and second hydraulic means so that said second hydraulic lifting means requires more hydraulic fluid pressure to lift said upper conditioning roll than is required by the first hydraulic means to lift the header; and
said first and second hydraulic roll lift cylinders pivotally mounted on said header adjacent the left and right ends of said upper conditioning roll, the centerline of said first roll lift cylinder being in the plane of rotation of the lever arm on the left end of said upper roll, the centerline of said second roll lift cylinder being in the plane of rotation of the lever arm on the right end of said upper roll, one end of each of said first and second roll lift cylinders being pivotally attached to said lever arms at locations for causing said upper conditioning roll to be opened against the force of said spring tension means when the pistons of said cylinders are extended due to application of hydraulic fluid pressure.

4,546,600

HEADER PIVOT SUPPORT

Garry W. Busboom, Independence, Mo., and Larry R. James, Olathe, Kans., assignors to Allis-Chalmers Corp., Milwaukee, Wis.

Filed Feb. 23, 1984, Ser. No. 583,008
Int. Cl.[4] A01D *35/12*
U.S. Cl. 56—208 9 Claims



1. In a mobile agricultural harvester including main frame and crop header at its forward end, the combination comprising:
a pair of laterally spaced upright posts at the front of said main frame presenting a pair of flat forward facing mounting surfaces lying in a transverse vertically extending plane,
a pivot connection between said crop header and said main frame permitting vertical swinging movement of said crop header about a transverse pivot axis, said pivot connection including a pair of axially spaced bearing components presenting radially outward facing cylindrical bearing surfaces aligned on said transverse axis and a pair of pivot collars with cylindrical surfaces defining aligned bores engaging said bearing surfaces of said pivot bushings, respectively, said pivot collars having rear thrust surfaces in rearward thrust transmitting engagement with said flat mounting surfaces on said posts, respectively,
upper and lower releasable tension members interconnecting each of said pivot collars to its associated post, said tension members extending longitudinally above and below said pivot collars, respectively, and exerting rearward thrust to cause the pivot collars to be held against the respective mounting surfaces of said posts with sufficient force to prevent relative movement between said collars and posts, said tension members being spaced vertically from their

associated pivot collars to permit vertical adjustment of the latter relative to said posts upon release of said tension members and

a mechanism for adjusting the vertical position of said pivot collar in relation to the associated post including

a U-shaped thrust member having a base and a pair of laterally spaced flanges extending upwardly from said base and disposed on laterally opposite sides of the associated lower tension member, said flanges having upper ends in vertical thrust transmitting engagement with the underside of said pivot collar, and

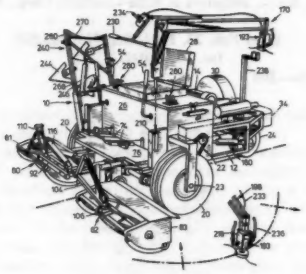
adjustment means interposed between said frame and said base operable to adjust said U-shaped thrust member and pivot collar vertically relative to the associated post when said tension members associated with said collar are released.

4,546,601

LAWN AND GARDEN MAINTENANCE APPARATUS

Jens B. Skovhoj, 138 Brahms Ave., Willowdale, Ontario, Canada M2H 1H8

Filed Feb. 11, 1983, Ser. No. 465,779
Int. Cl.[4] A01D *55/20, 35/24, 53/06*
U.S. Cl. 56—249 **2 Claims**



1. An apparatus for use in lawn and garden maintenance comprising:

a chassis having a pair of axially aligned and independently operable drive wheels journally mounted thereon and having at lease one idler wheel swivelly mounted thereon offset from the axis of the drive wheels;

a central reel mower mounted on the chassis with the rotational axis thereof lying in the vertical plane of the axis of the drive wheels;

means mounted on the chassis to operate the drive wheels;

a pair of outer reel mowers mounted one on each side of the chassis, and means mounted on the chassis to operate the outer reel mowers;

means to raise and lower each outer reel mower independently into an inoperative and an operative position respectively, and means to disengage each outer reel mower from the operating means when that mower is raised into an inoperative position, said disengaging means comprising a pair of clutch plates separable on pivoting the mower into the inoperative position.

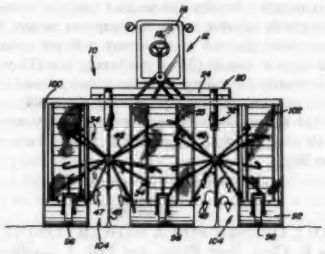
4,546,602

CHILI PEPPER HARVESTER

Robert O. Cosimati, 2005 Burke Rd., Las Cruces, N. Mex. 88005

Filed Sep. 17, 1981, Ser. No. 303,111
Int. Cl.[4] A01G *19/00*
U.S. Cl. 56—327 R **14 Claims**

1. A harvester for produce such as chili peppers comprising frame means adapted to be supported from a tractor-type vehicle for traversing rows of plants for picking produce therefrom, at least one picking unit adjustably mounted on said frame means, said picking unit including a rotatable member disposed generally parallel to the row of plants and a plurality of picking members mounted radially of the rotatable member, said picking members terminating in free end portions spaced circumferentially around the rotatable member each picking member including means on the end portion thereof for engaging produce on a plant and removing the produce from the plant in response to rotation of the rotatable member and



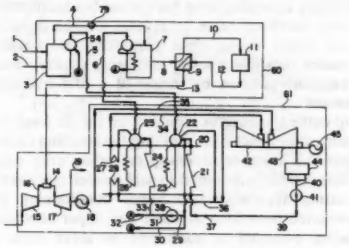
forward movement of the frame means, each picking member being in the form of an elongated rod, said means on the end of the picking member including a U-shaped end portion on the rod defining a substantially hook-like configuration with a large radius of curvature with the free end of the U-shaped portion of the rod extending toward the direction of rotation of the rotatable member and inwardly toward the rotatable member, said rotatable member being drivingly connected to a motor.

4,546,603

COAL GASIFICATION COMPOSITE POWER GENERATING PLANT

Tadao Arakawa; Yoshiki Noguchi; Yukio Hishinuma, and Nobuo Nagasaki, all of Hitachi, Japan, assignors to Hitachi, Ltd. and Hitachi Engineering Co., Ltd., both of Tokyo, Japan

Filed Jun. 8, 1984, Ser. No. 618,553
Claims priority, application Japan, Jun. 10, 1983, 58-102650
Int. Cl.[4] F02C *3/28*
U.S. Cl. 60—39.12 **5 Claims**



1. A coal gasification composite power generating plant comprising:

a coal gasification plant having a coal gasification furnace of pressurized fluidized bed type, in which coal is gasified at a pressure higher than the atmospheric pressure, a first steam generator for recovering heat from the gas generated in said gasification furnace thereby to cool said gas, a second steam generator disposed at the outlet of said coal gasification furnace and adapted to recover heat from the unrefined gas coming out of said gasification furnace, and a gas refining apparatus for refining the unrefined gas

which has been cooled through heat recovery by said second steam generator; and

a composite power generating plant including a gas turbine which operates using the gas generated by said gasification plant as the fuel, a boiler for recovering heat wasted from said gas turbine, and high-pressure and low-pressure steam turbines which operate with the steam generated by said boiler;

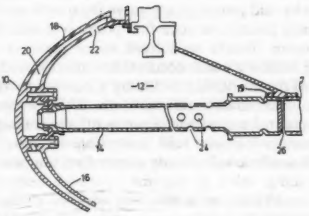
wherein the improvement comprises that the steam generated in said second steam generator has a pressure higher than that of the steam generated in said first steam generator, and the low-pressure steam and the high-pressure steam from said steam generators are introduced, respectively, to said low-pressure steam turbine and said high-pressure steam turbine.

4,546,604

NOSE BULLET ANTI-ICING FOR GAS TURBINE ENGINES

Alan Moore; Geoffrey E. Harman; David G. Rosser, and Edward F. Clapham, all of Bristol, England, assignors to Rolls-Royce Limited, Bristol, England

Division of Ser. No. 416,277, Sep. 9, 1982, Pat. No. 4,485,619, which is a continuation of Ser. No. 138,143, Apr. 7, 1980, abandoned. This application Oct. 29, 1984, Ser. No. 666,234
Claims priority, application United Kingdom, Apr. 17, 1979, 7913292
Int. Cl.[4] F01D *5/08*
U.S. Cl. 60—39.093 **7 Claims**



1. A gas turbine engine having a nose bullet rotatable about a longitudinal axis of the engine and an anti-icing system for the nose bullet, said anti-icing system comprising:

a chamber rotating with said nose bullet and having a rearward region which is relatively hotter than a forward region of said chamber;

said nose bullet having inner and outer skins defining a space therebetween, said space having a forwardly located sub-chamber therein adjacent to a central region of said nose bullet to be heated, said space providing communication between said sub-chamber of said nose bullet and the rearward region of said chamber; and

wall means for defining a conduit for gas circulating within said chamber, said wall means having an upstream end terminating adjacent to and communicating with said sub-chamber and a downstream end with passage means adjacent thereto for providing communication between said wall means and said rearward region of said chamber, no cross-sectional diameter of said upstream end of said wall means being greater than a cross-sectional diameter downstream thereof, and said cross-sectional diameter of said upstream end being less than that of said downstream end;

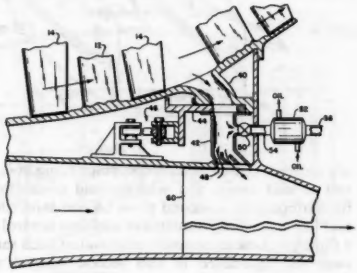
said wall means constraining said gas to flow toward said upstream end and into said sub-chamber for de-icing said central region, said gas being cooled by contact with said central region of said nose bullet and centrifuged radially outwardly due to rotation of said chamber through said space and into the relatively hotter region of said chamber for heating therein, said chamber constraining said gas to flow through said passage means and into the downstream end of said wall means, thereby creating a thermosyphon effect to induce the gas to recirculate at least in part from said relatively hotter region of said chamber and through said wall means to impinge on said central region of said nose bullet.

4,546,605

HEAT EXCHANGE SYSTEM

Thomas P. Mortimer, Bolton, and Gabriel L. Suciu, Storrs, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 16, 1983, Ser. No. 562,126
Int. Cl.[4] F02K *3/06*
U.S. Cl. 60—226.1 **3 Claims**



1. For a fan-jet engine having a fan discharge duct, a compressor having a high pressure compressor section and a low pressure compressor section, fluid connecting means interconnecting the compressor and the fan discharge duct, a heat exchanger located internally of said engine, means for leading a fluid medium intended to be cooled through said heat exchanger and duct means interconnecting said fluid connector means and said heat exchanger for selectively conducting compressor discharge air or fan discharge air to said heat exchanger, valve means for flowing and blocking the flow of compressor discharge air or fan discharge air to said heat exchanger, said fluid connecting means for interconnecting said compressor and fan discharge duct is the connection for the surge bleed system of said engine and a gate valve in said fluid connecting means operable to an open position to spill out compressor discharge air to prevent surge from ensuing.

4,546,606

PRESSURE DROP REGULATING DEVICE

Jean G. Bouiller, Brunnoy; Marc F. B. Buisson, Le Meé sur Seine; Gerard E. A. Jourdain, Saintry sur Seine; Denis J. M. Sandelis, Nangis, and Yves R. A. Urruty, Melun, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed May 4, 1983, Ser. No. 491,372
Claims priority, application France, May 4, 1982, 82 07692
Int. Cl.[4] F02K *3/02*
U.S. Cl. 60—262 **3 Claims**

1. In a multiflow turbojet engine having a primary gas flow channel and a secondary gas flow channel coaxially surrounding said primary flow channel, a device for regulating a pressure drop of a gas flow in at least one of the channels, said device comprising:

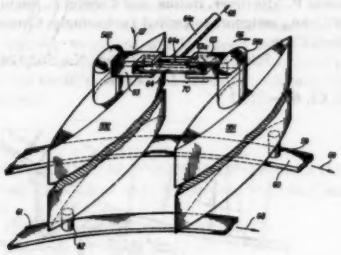
a plurality of pivotable vanes in at least one of said channels;

two control rings;

connection means connected between said control rings and said vanes, said connection means comprising means responsive to rotation of said at least control ring and respectively connecting first and second control rings to first and second ones of said vanes, for pivoting said first

ones of said vanes in a first rotational sense and said second ones of said vanes in a second rotational sense opposite said first rotational sense, said first and second vanes being mutually alternating in position; and

means for moving said at least one control ring, wherein each said vane includes a first pivot extending through a radially outer wall of said second flow channel, wherein said control rings are in, and concentric with, said second-



ary channel, one of said control rings being at either axial end of said vanes, and wherein said connection means further comprise a second pivot on one axial end of each said first vane and journalled in said first control ring, and a third pivot on an opposite axial end of each said second vane and journalled in said second control ring, and wherein said means for moving are connected to said first pivot of only two adjacent vanes.

4,546,607

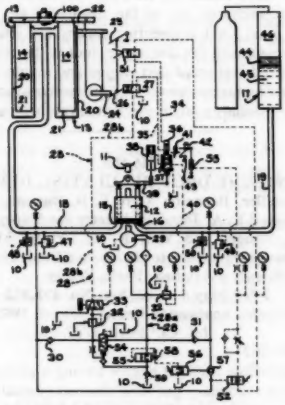
PUMPING APPARATUS

James A. Kime, Columbus, Ohio, assignor to Hydro-Horse, Inc., Columbus, Ohio

Continuation-in-part of Ser. No. 209,391, Nov. 24, 1980,. This application Apr. 28, 1983, Ser. No. 489,584

Int. Cl.⁴ F16H *39/46*

U.S. Cl. 60—372 **7 Claims**



1. A pumping apparatus for use in pumping a viscous mass from a well having a down-hole pump, sucker rod and polish rod extending through a well-head fixture comprising, in combination:

a lifting means for operating such down-hole pump, said lifting means being mounted on such well-head fixture, wherein said lifting means includes at least two hydraulic cylinders, each of said hydraulic cylinders including a piston means, said individual piston means of said hydraulic cylinders being operatively connected to such polish rod;

a first pumping means having first and second ports, said first pumping means being in communication with said lifting means at said first port;

an accumulator means containing fluid under a predetermined precharge pressure in communication with said first pumping means at said second port, wherein said first pumping means receives such precharged fluid from said accumulator and pumps such fluid to said lifting means adding a cumulative pressure to such precharge pressure to create a working force on such fluid, whereby said connection piston means are driven by such fluid under a working pressure to move such polish rod; and

a pump-off control means in communication with said lifting means and said first pumping means including a pilot control means for controlling the direction of fluid flow through said first pumping means, said pilot control means including a stroke reverse means in communication with said lifting means and a stroke reverse servo apparatus in communication with said stroke reverse means for directing said first pumping means to move said piston means from a first predetermined position to a second predetermined position by pumping fluid under pressure from said accumulator means to said lifting means, said pilot control means further directing said first pumping means through said stroke reverse means and said stroke reverse servo apparatus to reverse the flow of the fluid when said piston means reaches such second predetermined position, whereby said piston means move from such second predetermined position to such first position as said first pumping means directs such fluid under pressure from said lifting means to said accumulator means, said pump-off control means further including a down-hole referencing means in communication with said lifting means and said pilot control means and a pump-off sequencing valve in communication with said down-hole referencing means, said down-hole referencing means directing said pump-off sequencing valve to become operative only when said pilot control means is directing said first pumping means to pump the fluid under pressure from said lifting means to said accumulator means and said piston means reach a specific location as said piston means are moving from such second predetermined position to such first predetermined position, wherein said pump-off sequencing valve regulates the extent of the displacement of said first pumping means in response to variations in the forces exerted on said lifting means by the down-hole masses.

4,546,608

THERMO-SIPHON TYPE GENERATOR APPARATUS

Koji Shiina; Seiichiro Sakaguchi, and Yasuaki Akatsu, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 28, 1983, Ser. No. 536,518

Claims priority, application Japan, Sep. 29, 1982, 57-168647; Dec. 20, 1982, 57-221866

Int. Cl.⁴ F01K *9/00, 21/00*

U.S. Cl. 60—649 **11 Claims**

1. A thermo-siphon type generator apparatus comprising:

a vessel filled with a working medium containing a heat medium and a low boiling-point medium which are insoluble to each other, said vessel defining a lower evaporating section, an upper condensing section and a heat-insulated section between said evaporating and condensing sections;

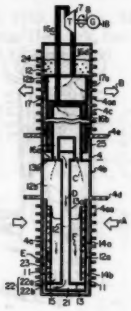
a turbine connected to a generator;

a first passage means for introducing the vapor of said low-boiling-point medium generated in said evaporating section to said turbine;

a second passage means for introducing the vapor from said turbine to said condensing section;

said evaporating section including a space in which said heat medium flows downwardly, a vapor bubble pumping

space and a third passage means in which the low-boiling-point medium liquid flows downwardly, said pumping space and said space in which the heat medium flows downwardly being communicated with each other at their upper ends and their lower ends, and said space in which said low-boiling point medium liquid flows downwardly



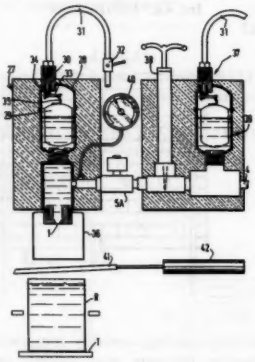
being communicated with the lower end of the pumping space, said pumping space being adapted to generate, when heated, upward movement of vapor bubbles of said low-boiling-point medium thereby to forward the vapor of said medium to said turbine through said first passage means.

4,546,609

APPARATUS FOR PROVIDING A CONTINUOUS STREAM OF A CRYOGENIC LIQUID AND IN PARTICULAR LIQUID NITROGEN

Alain Roullet, Villejuif, and André Lermuzeaux, Sucy-en-Brie, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed May 23, 1984, Ser. No. 613,252
Claims priority, application France, May 30, 1983, 83 08887
Int. Cl.⁴ F17C *13/02*
U.S. Cl. 62—49 **15 Claims**



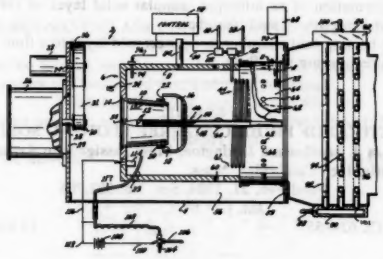
1. An apparatus for delivering a continuous thin stream of a cryogenic liquid, in particular liquid nitrogen, said apparatus comprising a pressure regulating device having a liquid inlet conduit, liquid outlet conduit means and a stop valve having a body and provided in the outlet conduit means outside the pressure regulating device, said outlet conduit means comprising an upstream conduit portion extending from said pressure regulating device and including a first chamber of said stop valve body, and a downstream conduit portion comprising a second chamber of said body separated from said first chamber by a seat for a closure member of said valve and extending to a calibrated liquid discharge orifice communicating with free air, the apparatus further comprising a degassing device having an inlet port communicating with said downstream conduit portion.

4,546,610

PREVAPORIZING COMBUSTION METHOD

Eugene B. Zwick, 5471 Argosy Ave., Huntington Beach, Calif. 92646

Continuation of Ser. No. 115,959, Jan. 28, 1980, abandoned, which is a division of Ser. No. 615,166, Sep. 22, 1975, Pat. No. 4,255,116. This application Aug. 16, 1982, Ser. No. 408,509
Int. Cl.⁴ F17C *7/02*
U.S. Cl. 62—52 **4 Claims**



1. In a heat exchanger characterized by a low pressure drop thereacross as compared to the pressure level at which said heat exchanger operates, said heat exchanger for vaporizing liquid, and having a tube which provides a flow path through the heat exchanger, said low pressure drop being created in said tube, an improvement comprising:

an orifice in flow relation with said tube wherein a fluid flowing in said tube at a liquid inlet flow rate enters in a liquid state into said tube through said orifice and is converted into a gaseous state downstream in said tube at a distance from said orifice at a tube pressure, said fluid in gaseous state exiting said tube at a gas outlet flowing;

said orifice being disposed at the input of said tube and being sized to provide an inlet pressure drop to said liquid fluid entering said tube which inlet pressure drop is set equal to a fractional portion of said low pressure drop across said tube, said fractional portion having an absolute magnitude at least large enough so that the absolute magnitude of the change in said gas outlet flow rate produced by any given change in said tube pressure is greater than the absolute magnitude of the change in said liquid inlet flow rate produced by said same given change in said tube pressure,

whereby time dependent fluctuations of the fluid flow within said tube may be avoided.

4,546,611

UF_6-RECOVERY PROCESS UTILIZING DESUBLIMATION

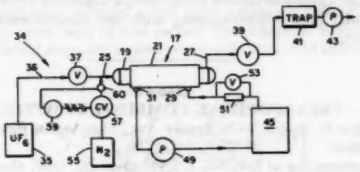
Robert S. Eby, 11 Newhope La.; Michael J. Stephenson, 115 Concord Rd., both of Oak Ridge, Tenn. 37830; Deborah H. Andrews, 421 Cumberland St., Harriman, Tenn. 37748, and Thomas H. Hamilton, 821 Walker Springs Rd., Knoxville, Tenn. 37923

Filed Dec. 21, 1983, Ser. No. 564,113
Int. Cl.⁴ F17C *13/00*
U.S. Cl. 62—54 **9 Claims**

1. A UF_6-recovery process, comprising:

(a) withdrawing a stream of substantially pure UF_6 process gas from a UF_6 gas-centrifuge cascade,

(b) adding a relatively noncondensable, nonreactive gaseous component to said stream to provide in said stream a concentration thereof in the range of about 0.2% to 1% by volume,



(c) directing the resulting stream through a cooled chamber under conditions effecting desublimation of said UF_6 and formation of an adherent, annular solid layer of UF_6 on the interior of said chamber,

(d) heating said chamber to convert said layer to a fluid, and

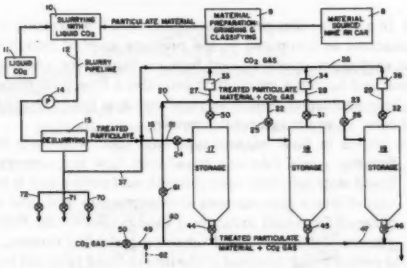
(e) recovering said fluid.

4,546,612

METHOD OF PRODUCING FREE FLOWING SOLIDS

Chakra J. Santhanam, Lexington, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Filed Feb. 21, 1984, Ser. No. 581,704
Int. Cl.[4] F17C *7/02*
U.S. Cl. 62—55 **12 Claims**



1. A process comprising forming a dry free-flowing composition substantially free of flow promoting and anti-agglomerating agents by

a. providing an organic or inorganic material in finely divided form;

b. mixing said material with liquid carbon dioxide to form a slurry; and

c. separating said mixed material from said slurry.

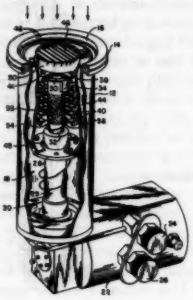
4,546,613

CRYOPUMP WITH RAPID COOLDOWN AND INCREASED PRESSURE

Michael J. Eacobacci, Randolph, and Donald A. Olsen, Millis, both of Mass., assignors to Helix Technology Corporation, Waltham, Mass.

Continuation of Ser. No. 481,783, Apr. 4, 1983, abandoned. This application Dec. 20, 1984, Ser. No. 684,967
Int. Cl.[4] B01D *8/00*
U.S. Cl. 62—55.5 **14 Claims**

1. A cryopump comprising a refrigerator having first and second stages, a second stage cryopumping surface in thermal contact with a heat sink on the second stage and held at a temperature of less than 50 K to condense low condensing temperature gases, a first stage cryopumping surface in thermal contact with a heat sink on the first stage and held at a temperature higher than the second stage to condense higher condensing temperature gases, a radiation shield surrounding the second cryopumping surface and in thermal contact with the first stage cryopumping surface, and a vacuum vessel surrounding the radiation shield and at a temperature substantially greater than the radiation shield, the improvement wherein:



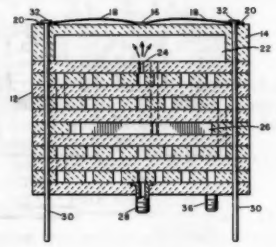
the effective emissivity between at least a portion of the radiation shield and the vacuum vessel is such that a sufficient thermal load due to thermal radiation is imposed on the first stage, at a first stage temperature approaching 50 K, to assure that the temperature of the first stage cryopumping surface is, under all operating conditions, greater than about 50 K.

4,546,614

PRECOOLED DETECTOR LEADS

Mark L. Kline, Fullerton, and Oakley G. Ross, Upland, both of Calif., assignors to General Dynamics Pomona Division, Pomona, Calif.

Filed Apr. 13, 1984, Ser. No. 600,068
Int. Cl.[4] F25D *25/00*
U.S. Cl. 62—62 **6 Claims**



1. A detector lead cooling assembly comprising:

a nonconductive detector post having sensing means mounted on one end thereof;

cooling means for cooling said post;

a plurality of conductor leads connected to said sensing means;

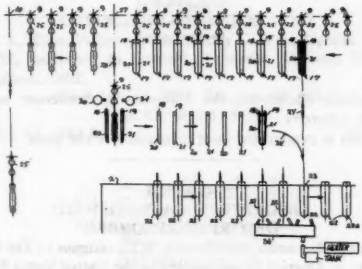
precooling means for precooling said leads, said precooling means comprising a plurality of bores extending along said post; and

said leads extending along said bores in heat transfer relation to said post.

4,546,615
METHOD FOR PICKING-UP ICE LOLLIES FROM FREEZING POCKETS IN AN ICE LOLLY FREEZING MACHINE AND PICKING-UP DEVICE FOR CARRYING OUT THE METHOD

Klaus Gram, Vojens, Denmark, assignor to Brodrene Gram A/S, Vojens, Denmark

Filed Dec. 12, 1983, Ser. No. 560,235
Claims priority, application Denmark, Dec. 17, 1982, 5604/82
Int. Cl.[4] A23G *9/00*
U.S. Cl. 62—73 **5 Claims**

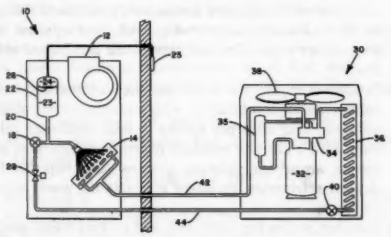


1. A method for picking-up ice lollies from rows of freezing pockets (22) in an ice lolly freezing machine in which the ice lollies are frozen in two-parted moulds (20,21) by which method the moulds (17) are thawed loose from a row of freezing pockets (22) in which freezing has taken place, are lifted up from the freezing pockets (22) and separated for release of the frozen ice lollies, assembled and inserted in a row of freezing pockets (22), comprising the steps of moderately heating the rows of freezing pockets (22) before lifting the moulds, the heating being carried out sufficiently for thawing the moulds (17) loose from the freezing pockets (22), lifting the moulds (17), moving the molds to a position (27) outside an area of the freezing pockets of the freezing machine, the moulds (17) being heated (at 30, 31) after having been moved outside said area, separating the moulds and removing the ice lollies from the moulds while the moulds (17) are outside said area, moving the moulds (17) back to said area, and inserting the moulds (17) in an empty row of freezing pockets (22).

4,546,616
HEAT PUMP CHARGE OPTIMIZER

Alan S. Drucker, Dewitt, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Feb. 24, 1984, Ser. No. 583,516
Int. Cl.[4] F25B *39/04*
U.S. Cl. 62—174 **5 Claims**



1. A method of charge optimization in a heat pump system including the steps of:

determining the optimum refrigerant charge in the colling mode for a predetermined ambient temperature range;

determining the optimum refrigerant charge in the heating mode at a predetermined ambient temperature;

determining the difference in the determined optimum charges for the cooling and heating modes;

providing a receiver with a variable storage volume which is sized to store an amount of refrigerant equal to the difference such that the refrigerant charge is varied between the heating and cooling modes;

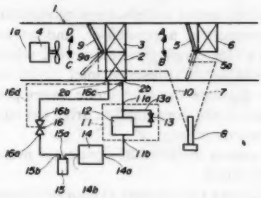
locating the receiver in the indoor section of the heat pump system such that the receiver is filled with liquid refrigerant in the heating cycle and gaseous refrigerant in the cooling cycle; and

varying the amount of refrigerant in the receiver responsive to ambient temperature whereby the refrigerant charge is optimized in each mode.

4,546,617
ENERGY-SAVING AIR CONDITIONING SYSTEM FOR VEHICLES

Nobuhiko Suzuki, and Masaya Sasaki, both of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1984, Ser. No. 626,431
Claims priority, application Japan, Jul. 5, 1983, 58-122239
Int. Cl.[4] B60H *3/00*
U.S. Cl. 62—180 **6 Claims**



1. An air conditioning system for a vehicle having a passenger compartment, comprising:

an air passage for guiding air to be discharged into said passenger compartment of said vehicle;

an evaporator arranged in said air passage for refrigerating air guided therein;

temperature setting means for setting the temperature of air discharged into said passenger compartment, said temperature setting means assuming a set position corresponding to a set value of the temperature of air discharged into said passenger compartment;

a compressor for compressing suction refrigerant supplied from said evaporator, said compressor controlling the flow rate of refrigerant discharged therefrom so as to maintain the pressure of said suction refrigerant at a predetermined fixed value;

a resistance element arranged in said air passage, said resistance element being juxtaposed with said evaporator along a line substantially normal to the direction of flow of air in said air passage and having flow resistance substantially equal to that of said evaporator;

a door arranged in said air passage at a location immediately upstream of said evaporator and said resistance element, said door being disposed to assume a variable opening determining the refrigerating capacity of said evaporator; and

driving means responsive to the set position of said temperature setting means for driving said door to vary the opening thereof;

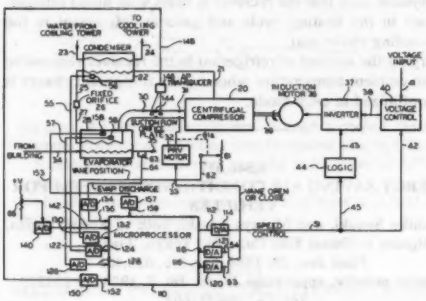
said door being disposed such that as the opening of said door varies, one of said evaporator and said resistance element has a substantial area of inlet opening thereof increased, and at the same time the other has a substantial area of inlet opening thereof decreased.

4,546,618

CAPACITY CONTROL SYSTEMS FOR INVERTER-DRIVEN CENTRIFUGAL COMPRESSOR BASED WATER CHILLERS

Kenneth J. Kountz, Palatine, Ill., and Richard A. Erth, York, Pa., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Sep. 20, 1984, Ser. No. 652,401
Int. Cl.[4] F25B *1/00*; F04B *49/00*
U.S. Cl. 62—201 **20 Claims**



1. A capacity control system for a refrigeration system including a compressor, a condenser, and an evaporator, all connected in a closed refrigeration circuit, which compressor includes a plurality of adjustable inlet guide vanes, a motor connected to regulate the inlet guide vanes position, and an electrical speed motor connected to drive the compressor, said control system comprising:

means for sensing the absolute condenser pressure to generate a first signal;

means for sensing the absolute evaporator pressure to generate a second signal;

means for sensing the physical position of the inlet guide vanes to generate a third signal;

means for sensing the temperature of the chilled water discharged from the evaporator to generate a fourth signal;

means for sensing a temperature set point to generate a fifth signal;

means for sensing the differential pressure across an orifice plate in a suction duct to generate a sixth signal;

means for sensing the temperature of the refrigerant vapor leaving the evaporator to generate a seventh signal; and

microprocessor means responsive to said first through seventh signals to generate control signals to regulate both the speed of the compressor drive motor and the position of the inlet guide vanes in an energy-conservation manner while avoiding surge.

4,546,619

MECHANICAL COOLER FOR ELECTRONICS

Thomas G. Rohner, P.O. Box 80427, Midland, Tex. 79709

Filed Jun. 25, 1984, Ser. No. 624,218
Int. Cl.[4] H02B *1/00*; F28F *7/00*
U.S. Cl. 62—419 **7 Claims**

1. In an electrical assembly having:

a. at least one heat sink and

b. a plurality of heat producing electrical elements mounted on the heat sink;

c. the improved structure for cooling the elements comprising:

d. a pad between each element and the heat sink, the pad directly thermally conductively connected to both the element and heat sink,

e. a first passage in each of the pads, and

f. a compressor,

g. a condenser, and

h. conduits connecting the compressor, condenser and the pads, whereby

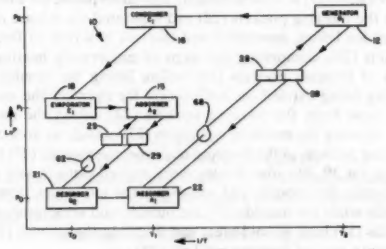
i. coolant is evaporated in at least some of the pads.

4,546,620

ABSORPTION MACHINE WITH DESORBER-RESORBER

Wendell J. Biermann, Fayetteville, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 5, 1984, Ser. No. 668,459
Int. Cl.[4] F25B *15/00*
U.S. Cl. 62—476 **3 Claims**



1. An improved absorption heat pump/refrigeration system comprising:

a generator means operating at a first temperature range for heating a first weak absorbent solution to generate a first vaporized refrigerant and a first strong absorbent solution;

a condenser means cooperating with said first generator means for condensing said first vaporized refrigerant;

an evaporator means for receiving said condensed refrigerant from said condenser means, said condensed refrigerant in heat exchange relationship with heat applied to said evaporator means for vaporizing said condensed refrigerant;

an absorber means for receiving the vaporized condensed refrigerant in combination with a second strong absorbent solution, said absorber means in heat exchange relationship with a cooling medium means whereby said second strong absorbent solution absorbs said vaporized condensed refrigerant resulting in a second weak absorbent solution;

a desorber means for receiving said second weak absorbent solution therein, said second weak absorbent solution in heat exchange relationship with a heating medium means which withdraws heat from a load whereby said second weak absorbent solution is partially vaporized resulting in said second strong absorbent solution and a second vaporized refrigerant;

means for circulating said second strong absorbent solution to said absorber means;

a resorber means for receiving and mixing said second vaporized refrigerant with said first strong absorbent solution of said first generator means, said mixed second vaporized refrigerant and said first strong absorbent solution in heat exchange relationship with a cooling medium whereby said first weak absorbent solution is formed; and

means for circulating said first weak absorbent solution to said first generator means for use therein.

4,546,621

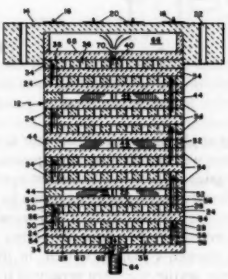
CRYOGENIC DETECTOR POST

Mark L. Kline, Fullerton, and Oakley G. Ross, Upland, both of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Filed Apr. 13, 1984, Ser. No. 600,069

Int. Cl.[4] F25B *19/00*

U.S. Cl. 62—514 R **10 Claims**



1. A cryogenic detector post, comprising:

an elongated monolithic body member having a mounting end and a sensing end on which sensors are mounted, said body member being constructed of a plurality of nonconductive wafers stacked together and connected into a unitary structure,

an inlet port for communicating with a source of high pressure gas;

an outlet port for exhausting gas;

a cooling chamber at said sensing end; and

said wafers having interconnecting passageway means formed therein for communicating said inlet port with said cooling chamber along a gas supply path and communicating said cooling chamber with said outlet port along a gas return path.

4,546,622

CIRCULAR KNITTING MACHINE FOR PRODUCING KNIT GOODS HAVING ENMESHED FIBERS

Adolf Seidel; Peter Artzt; Gerhard Egbers, all of Reutlingen; Helmut Grimm, Neckartailfingen; Klaus Künde, Kohlberg, and Anton Schenek, Bempflingen, all of Fed. Rep. of Germany, assignors to Sulzer Morat GmbH, Fed. Rep. of Germany

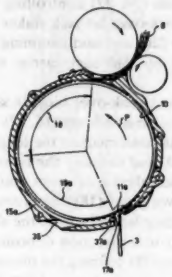
Filed Mar. 14, 1983, Ser. No. 475,389

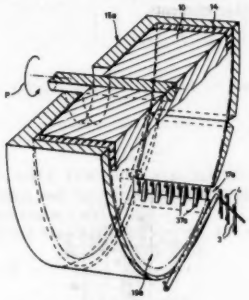
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1982, 3212580

Int. Cl.[4] D04B *9/14*; D01G *15/40*

U.S. Cl. 66—9 B **14 Claims**

1. A circular knitting machine for the manufacture of knit goods with combed-in fibers, comprising: at least one rotary needle cylinder supporting movable knitting needles having hooks and at least one carding device having a feed apparatus for a band of fibers, a combing-in zone, through which the knitting needles pass, and means for receiving said band of fibers, separating said band of fibers into individual fibers flowing in air and transporting said individual flowing fibers to the combing-in zone for being inserted contactlessly into the needle hooks, characterized in that guide means are provided





between said feed apparatus and said combing-in zone for dividing said individual flowing fibers into a plurality of separate fiber streams.

4,546,623

KNITTING MACHINE WITH CONTROLLABLY ROCKABLE KNOCK-OVER BITS

Falk Kühn, Kiebingen, and Alfred Buck, Hailfingen, both of Fed. Rep. of Germany, assignors to Memminger GmbH, Freudenstadt, Fed. Rep. of Germany

Filed Dec. 8, 1983, Ser. No. 559,495

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1982, 3246512

Int. Cl.[4] D04B *15/06, 15/24*

U.S. Cl. 66—104 **12 Claims**

1. Knitting machine having

at least one needle carrier (1);

a plurality of knitting needles (5) located, spaced from each other, on the needle carrier, and movable thereon;

a needle cam race (45, 170) controlling movement of the needles (5);

a plurality of knock-over bit-jack sinker elements (3), each having a shaft (4), a knock-over head and a butt (6) projecting laterally from the shaft (4),

the knock-over bit-jack sinker elements being inserted between the needles, the knock-over bit-jack sinker elements (3) being slidable independently of movement of the needles between the needles and, additionally, being positioned for movement of the jack heads (7) transverse to the movement of the needles in the plane of sliding movement of the elements (3);

and individual cam means for controlling, independently, longitudinal movement of the elements and transverse movement of the element heads (7), including

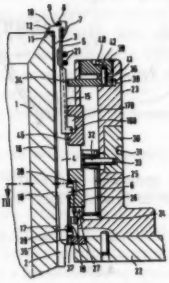
a cam structure (26) defining a cam race (28) engaged by the butts of the knock-over bit-jack sinker elements (3) and controlling longitudinal movement of said elements, and camming elements (36, 37) controlling transverse movement of said knock-over bit-jack sinker elements,

said cam structure (26) and said camming elements (36, 37) being supported by said cam carrier structure (22, 23), wherein

each shaft (4) of the knock-over bit-jack sinker elements (3) is formed as a double-arm lever (16, 17), having a fulcrum or pivot point (18) intermediate the length of the shaft (4) of the element (3) and defining the lever arms (16, 17) on either side of said fulcrum or pivot point,

said fulcrum or pivot point (18) comprises

a projection extending laterally from the shaft (4) of each of the elements and in a direction opposite that of the butt (6), the projection (18) defining the pivot or fulcrum point, and the butt being located on at least approximately the same level as the pivot point, with respect to the longitudinal extent of the shaft (4), of the respective knock-over bit-jack sinker elements,



the fulcrum or pivot point being supported on the needle carrier (1) and permitting rocking of the shaft (3) of said element about an axis transverse to the longitudinal extent of the element;

and wherein the camming elements (36, 36', 37) for controlling transverse or rocking movement comprises

cam surfaces (34, 35) acting, respectively, on the two arms (16, 17) of the double-arm lever,

the cam surfaces controlling, respectively, rocking or pivoting movement of said elements about said fulcrum or pivot point (18) and hence transverse movement of the element heads (7) in respectively opposite direction while permitting longitudinal slidable movement of said elements independently of said rocking or pivoting movement, and independently of movement of the needles under control of the needle cam race (45);

said cam structure (26) defining the cam race (28) being located intermediate the camming elements (36, 37) and being supported by the cam carrier structure for longitudinal adjustable movement with respect to the cam carrier structure.

4,546,624

DEVICE FOR THE CONTINUOUS DYEING AND/OR FINISHING OF WET TEXTILE WEBS

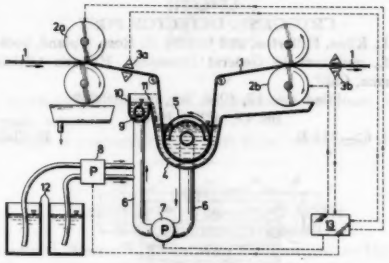
Hans-Ulrich von der Eltz, Frankfurt am Main, and Peter Oppitz, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 25, 1983, Ser. No. 488,035

Claims priority, application Fed. Rep. of Germany, May 5, 1982, 3216731

Int. Cl.⁴ D06B *23/26*

U.S. Cl. 68—13 R **7 Claims**



1. A device for applying in a level manner to a continuously moving and water-wet textile web an aqueous impregnating liquor which contains at least one treatment agent, said web (1) having been uniformly part-dewatered down to a certain residual moisture content entrained from a preceding wet-treatment, the device consisting of a liquor applying equipment and two dewatering elements (*2a*,*2b*) which, in direction of the moving path of the textile web, are arranged in sequence, one of which in advance of and the other one after the said liquor applying equipment, acting over the width of the web, and are both combined with a downstream piece of equipment (*3a*,*3b*) exhibiting more than two measuring positions distributed across the width of the web to measure, in a constant and contact-free manner along, as well as transverse, the moving path of the textile material, the web's respective moisture content at the said positions, the two dewatering elements (*2a*,*2b*) and corresponding measuring devices (*3a*,*3b*) are interrelated with each other as well as the liquor applying equipment via connecting lines and focussed in a coordinating member which, based on the collected informations of the dewatering performance at the positions of *2a* and *2b* forwarded from the measuring equipments *3a* and *3b*, is continuously determining the resulting differences in the moisture balance and, in agreement with the measured values and in relation with the target value, converting into control signals to the means having a monitoring fuhction over the liquor application, to adjust the amount of the applied impregnating liquor, which comprises following up the first dewatering element (*2a*) and the sub-ordinated measuring equipment (*3a*) and prior to the second dewatering element (*2b*) and the sub-ordinated measuring equipment (*3b*) there is provided an impregnating trough (4) which has, arranged therein in a position to be immersed in the liquid, a liquor exchange unit (5) for replacing the moisture already present on the web passed in open width over the unit (5) with impregnating liquor sucked or pressed through the web as well as, at the same time, applying the particular predetermined quantity of impregnating liquor, a pipe (6) connected thereto plus a built-in circulation pump (7) for forming a circulation system for the flowing impregnating liquor, a metering pump (8) which is connected to this pipe (6) and has feed lines for supplying the liquor cycle with freshly prepared liquor replenishments for strengthening or filling up spent/consumed circulation liquor, and, in the direction of flow below the connection for the metering pump (8), mechanical means (9) which are incorporated in the circulation system to mix spent circulation liquor with the liquor replenishments metered in.

4,546,625

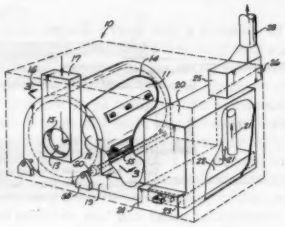
DRY CLEANING MACHINE

William L. Norrell, 105 Dove Rise, Peachtree City, Ga. 30269

Filed Jul. 30, 1984, Ser. No. 635,521

Int. Cl.[4] D06F *21/04, 29/00*; C14C *15/00*

U.S. Cl. 68—18 F **9 Claims**



1. In a machine of the type for cleaning draperies, furs and the like having:

a rotating drum for tumbling cleaning agents and articles to be cleaned, said drum having a plurality of ribs axially disposed along its inner surface, said drum having a front end for the loading and unloading thereof;

a shroud completely surrounding said rotating drum, said shroud having an air entry port located at the center of the front end of the rotating drum and an air exit port;

means for rotating said drum;

air blower means having an air intake connected to the air exit port of said shroud;

collector means affixed to the air exit port of said shroud, said collector means being located between said air exit port and the intake of the air blower means; wherein the improvement comprises:

a plurality of groups of openings through the side of said drum between the ribs thereof;

a plate held by biasing means against the outer surface of the drum over each group of openings, said plate conforming to the shape of the outer surface of the drum so that all openings of each group of openings are closed by said plate, said biasing means being of a strength to permit the plate to move away from the outer surface of the drum when said air blower means is activated and sufficient to hold the plate against the drum when said air blower means is turned off.

4,546,626

OVERLOAD-SECURITY FOR STAKING MACHINES FOR LEATHER INDUSTRY

Joseph Zwaans, Horiser Wald 78, 6780 Pirmasens 22, Fed. Rep. of Germany

Filed May 25, 1982, Ser. No. 498,155

Claims priority, application Fed. Rep. of Germany, May 25, 1982, 8215136[U]

Int. Cl.[4] C14B *1/40*

U.S. Cl. 69—33 **2 Claims**

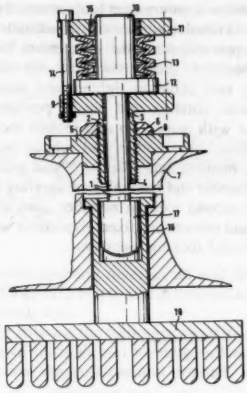
1. An overload security system connected to a member for a non-vibrating plate of a leather vibration staking machine comprising:

a piston guided by a bushing having threads around its outer surface, one end of said piston being positioned so as to receive pressure from the member for the non-vibrating staking plate;

a base plate surrounding said bushing;

a counter nut positioned adjacent said base plate for threadably engaging said threads of said bushing for adjusting the position of said piston relative to said base plate;

spring means of a pre-selected strength positioned relative to said piston so as to be caused to compress when a predetermined critical pressure exerted on the piston is exceeded.



4,546,627

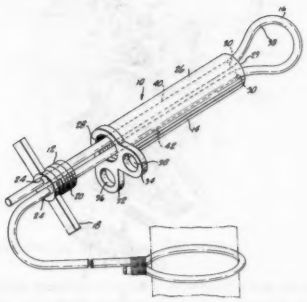
CABLE LOCKING MECHANISM

Carl F. Shrawder, and Peter Randall, both of 14934 Stonesboro Pl., Sherman Oaks, Calif. 91403

Filed May 23, 1983, Ser. No. 497,170

Int. Cl.[4] E05B *73/00*

U.S. Cl. 70—18 **5 Claims**



1. A locking mechanism adapted for use with a padlock for securing together one or more objects, said mechanism comprising: a first locking member including a radially extending handle portion and an axially extended threaded engagement portion secured to said handle portion and having a pair of spaced apertures extending radially therethrough; a second locking member including an axially extended hollow tubular portion having an open end and a closed end, said closed end having a pair of spaced apertures extending axially therethrough and said open end being adapted for threaded engagement with said engagement portion of said first locking member and a flange portion secured to and extending radially from said tubular portion adjacent said open end thereof, said flange portion having at least one aperture therein; and a flexible cable adapted to be extended through one of said apertures in said threaded engagement portion of said first locking member, through said tubular portion of said second locking member and out one of said apertures in said closed end thereof and looped back through the other of said apertures, through said

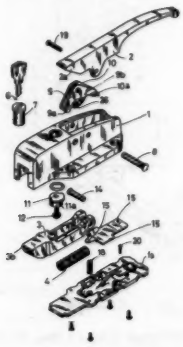
tubular portion and out the other of said aperture in said threaded engagement portion of said first locking member so as to slidably dispose said first and second locking members on said cable and define a securement loop externally adjacent the closed end of said tubular portion of said second locking member such that upon disposing the securement loop about the objects to be secured, sliding said first and second locking members along said cable to tighten said securement loop about said objects, rotating said handle portion of said first locking member with respect to said second locking member so as to twist said cable within said tubular portion of said second locking member and disposing said padlock about a portion of said handle and through said aperture in said flange portion of said second locking member, said loop is tightly secured about said objects in a fixed disposition with respect to said first and second locking members.

4,546,628

HANDLE DEVICE FOR DOORS

Kunihiko Takasaki, Chiba, Japan, assignor to Takigen Seizou Co., Ltd., Tokyo, Japan

Filed May 31, 1984, Ser. No. 615,949
Claims priority, application Japan, Oct. 19, 1983, 58-161781
Int. Cl.[4] E05B *65/10*
U.S. Cl. 70—92 **5 Claims**



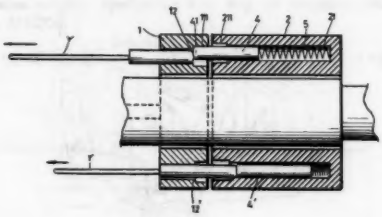
1. A handle device for a door comprising a device proper which is installed on a door panel, a handle grip which is connected to said device proper by a pivot pin, a latch which is retractably mounted on said device proper, an actuating lever which is connected in said device proper by said pivot pin and which is pushed by said handle grip to slide and retract said latch, a reset lever which is connected in said device proper by said pivot pin and which drives said actuating lever when pushed by a push rod extending inside the door, a lock plate which is secured to said device proper and which checks the retractive slide of said latch in engagement therewith, and a lock which is mounted on said device proper and which has a lock cam secured to a rotor, said lock cam releasing the engagement between said lock plate and said latch, so that when the inside push rod is pushed to turn said reset lever, the engagement between said lock plate and said latch is released, and said latch slides and is retracted by the turning of said actuating lever interlocked with said reset lever.

4,546,629

SAFETY GROOVE OF TUBULAR LOCKS

Shih M. Hwang, P.O. Box 7-369, Taipei City, 106, Taiwan

Filed Apr. 5, 1983, Ser. No. 482,221
Int. Cl.[4] E05B *27/08*
U.S. Cl. 70—363 **4 Claims**



1. A cylinder lock comprising:

an outer shell having first and second ends forming a cavity extending between and opening at said first and second ends, said first end having an annular flange extending inwardly therefrom;

a plug having front and rear sides and having a hole therethrough along its axis and having a plurality of first circumferential apertures extending from said front side partially through said plug, each aperature having an axis parallel to the axis of said hole, said plug having first grooves on said front side extending around said first circumferential apertures, said plug being disposed in said cavity and fixed snugly to an interior wall of said outer shell;

spring biased first pins slidably received in said first circumferential apertures;

a shaft member having a flange portion having a front face and a rear face extending outwardly therefrom and having a plurality of second circumferential apertures extending through said flange portion alignable with said first circumferential apertures, said flange portion having second grooves on said rear face extending around said second circumferential apertures, said shaft member being disposed in said cavity passing through said hole of said plug, said shaft member being adapted to be rotated therein, said flange portion fitting snugly against said interior wall of said outer shell; and

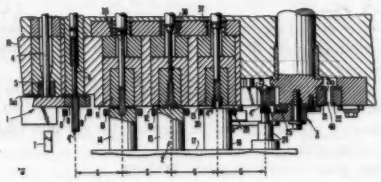
second pins slidably received in said second circumferential apertures.

4,546,630

FORMER HAVING CONTINUOUS FORMING-ROLLING ASSEMBLY

Yoshikazu Sakamura, 56, Kitamomodani-cho, Minami-ku, Osaka-shi, Japan

Filed Aug. 23, 1983, Ser. No. 525,674
Int. Cl.[4] B21D *43/05*
U.S. Cl. 72—68 **2 Claims**



1. A former, comprising

a quill having a forward end opening and a rear portion;

means for intermittently feeding a metal material in the form of a wire rod or bar through said rear portion and out said forward end opening of said quill;

cutter means, having a blade reciprocally movable transversely of said forward end opening of said quill, for cutting the metal material into workpieces of predetermined length;

a press assembly having a ram, and a plurality of pressing stages, N in number, including a first stage and a last stage, said plurality of pressing stages being successively and equally spaced by a distance S in a single plane containing said quill, said first stage being spaced a distance equal to said distance S from said quill, said pressing stages including a plurality of dies aligned in a first line in said plane, and a plurality of punches aligned in a second line in said plane on said ram, each of said plurality of stages including corresponding ones of said plurality of dies and of said plurality of punches, said ram being reciprocally movable toward and away from said plurality of dies so as to reciprocally move the punches toward the die of each of said plurality of stages to press workpieces in said stages between said plurality of dies and said plurality of punches;

a rolling mechanism having means for rollingly shaping the periphery of said workpieces, said rolling mechanism having a rolling die for rollingly engaging the workpieces therein, and having a feed inlet immediately adjacent said rolling die in said plane along said first line a fixed distance equal to said distance S from the die of said last stage, for receiving a workpiece from said last stage;

means for reciprocally moving said ram toward and away from said plurality of dies;

means, including a plurality of workpiece engagable transfer chucks, N+1 in number, successively and equally spaced apart by a fixed distance equal to said distance S in a third line parallel said first line, and means for reciprocally moving said plurality of transfer chucks in a direction parallel said third line in synchronism with said ram moving means, for transferring in unison in said direction respective workpieces respective fixed distances equal to said distance S from said quill to said first stage, between successive ones of said plurality of stages, and between said last stage and a position aligned with said feed inlet; a pusher fixedly mounted on said ram for movement therewith, along said second line, spaced a fixed distance equal to said distance S from the punch of said last stage and aligned with said feed inlet such that said pusher pushes a workpiece at said position into said feed inlet when said ram moves toward said plurality of dies; and

means, including a plurality of gears coupling said ram moving means and said rolling die, for rotating said rolling die in unison with said ram moving means such that pressing of workpieces at said plurality of stages and rolling shaping of a workpiece located in said feed inlet are initiated in synchronism and completed in synchronism.

4,546,631

ROLLER MECHANISM FOR FORMING HELICAL SHAPES

Frantisek L. Eisinger, Demarest, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Continuation of Ser. No. 481,135, Apr. 1, 1983, abandoned. This application Feb. 12, 1985, Ser. No. 701,440

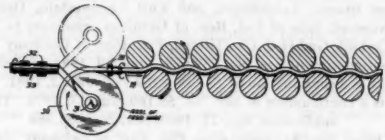
Int. Cl.[4] B21F *3/02*

U.S. Cl. 72—135 **12 Claims**

1. A roller mechanism for forming elongated helical-shaped structures using multiple forming rollers, comprising:

(a) a support frame having a fixed member and an adjustable member, each member being provided with means for rotatably supporting parallel multiple rollers;

(b) at least nine parallel cylindrical forming rollers spaced apart from each other and rotatably mounted in said support frame and arranged in a vertically non-aligned or staggered pattern in two sets, four rollers in a first set being rotatably mounted in said frame fixed member and rotatably driven and five rollers in a second set being adjustable relative to the first set for drawing a feed wire through the multiple rotating staggered forming rollers solely by a frictional drawing force exerted on the wire by said sets of forming rollers, and thereby form the wire passing through the rollers into a sinusoidal pattern;



(c) drive means coupling together all said driven rollers of said first set so as to rotate said driven rollers at a common surface speed; and

(d) means for rotating the feed wire about its own axis while being drawn through said forming rollers, so as to produce a helical shaped structural product.

4,546,632

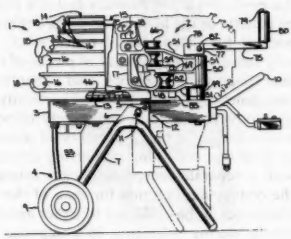
PORTABLE CONDUIT BENDING APPARATUS

Jan M. Van Den Kieboom, Greendale, and Ingo Valentin, Brookfield, both of Wis., assignors to Applied Power Inc., Brookfield, Wis.

Continuation of Ser. No. 368,278, Apr. 14, 1982, abandoned. This application Jun. 29, 1984, Ser. No. 626,581

Int. Cl.[4] B21D *7/024*

U.S. Cl. 72—158 **18 Claims**



4. A conduit bending apparatus, comprising:

a frame;

a bending shoe member rotatably mounted about an axis on the frame, said shoe member includes separate arcuate-shaped die portions disposed opposite one another, each die portion having a plurality of conduit-receiving grooves formed therein disposed parallel to one another and axially adjacent one another along the axis of rotation of said shoe, each of said grooves having a diameter differing from the others and substantially equal to the outer diameter of the conduit to be bent in that particular groove;

a roller member rotatably mounted on the frame for supporting conduit during bending, said roller member having a complementary conduit-receiving groove formed therein;

an adjusting means associated with said roller member for varying the diameter of its respective groove;

positioning means for moving one of said members between an operative position wherein said grooves tightly engage the periphery of a conduit disposed therebetween and an inoperative position, said positioning means includes means movable to a position adjacent said bending shoe member for cooperation therewith to bend conduit with said roller member being in inoperative position; and

drive means in driving engagement with one of said members for developing relative motion between said members to bend said conduit.

4,546,633
APPARATUS FOR CONVEYING TUBULAR OR BAR-SHAPED ROLLED STOCK

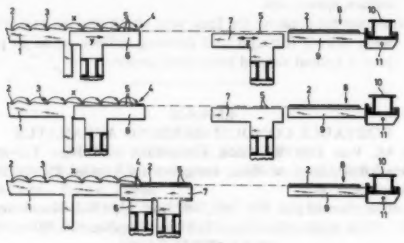
Hans Brauer, Leichlingen, and Kurt Leeuwestein, Duisburg-Neudorf, both of Fed. Rep. of Germany, assignors to Kocks Technik GmbH & Co., Hilden, Fed. Rep. of Germany

Continuation of Ser. No. 359,698, Mar. 19, 1982, abandoned, which is a continuation of Ser. No. 269,712, Jun. 2, 1981, which is a continuation of Ser. No. 58,169, Jul. 17, 1979. This application Sep. 27, 1984, Ser. No. 655,364

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1978, 2833631

Int. Cl.[4] **B21B** *39/20, 39/04;* **B21D** *43/00;* **B65G** *47/26*

U.S. Cl. 72—252 **8 Claims**



1. Apparatus for conveying pieces of elongate rolled stock from a discharge station at the delivery end of a cooling bed, a straightening pallette or the like to a severing device which has reception pockets for the pieces of rolled stock and which simultaneously sub-divides a plurality of pieces of rolled stock into individual longitudinal portions, said apparatus comprising at least one generally horizontally and vertically reciprocable collecting conveying device operatively disposed at the discharge station for collecting a plurality of pieces of rolled stock, the at least one collecting conveying device having a rigid bed with a separate reception pocket extending transversely of the conveying direction for each of the discharged pieces of rolled stock to be collected together and being movable rectilinearly, during collection, in a stepwise manner by one reception pocket pitch spacing at a time transversely of the longitudinal direction of the pieces of rolled stock lying in their reception pockets to carry the pieces of rolled stock along, and longitudinal substantially continuous bed longitudinally pocketed conveying means spaced from the discharge station for conveying the rolled stock in the latter's longitudinal direction, the longitudinal conveying means having the same pocket spacing, as said at least one collecting conveying device, and as the severing device to which delivery is to be made and the pieces of rolled stock being placeable into the reception pockets of the longitudinal conveying means without movement relative to one another by said at least one collecting conveying device, said at least one collecting conveying device reciprocating in a horizontal plane to and from the discharge station and the longitudinal conveying means.

4,546,634
METHODS AND APPARATUS FOR INITIATING TUBULAR EXTRUSION

Francis J. Fuchs, Jr., P.O. Box 10016, Naples, Fla. 33940

Continuation-in-part of Ser. No. 449,562, Dec. 13, 1982, abandoned. This application Sep. 19, 1983, Ser. No. 533,245

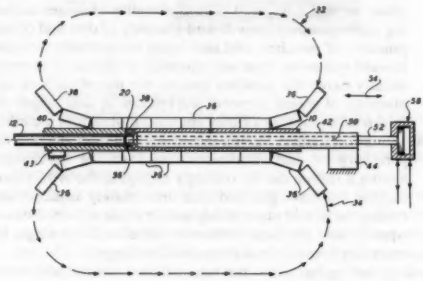
Int. Cl.[4] **B21C** *25/04, 31/00*

U.S. Cl. 72—264 **6 Claims**

1. Apparatus for extruding an elongated member such as tubing and for enhancing extrusion initiation, said tubing having an O.D., an I.D. and a wall thickness, comprising:

an annular extrusion die having a die surface defined by a forward truncated conical inner surface having a first predetermined included angle and a cylindrical rearward inner surface of constant diameter substantially equal to the tubing O.D.;

a mandrel having a forward portion defined by a truncated conical outer surface having a second predetermined included angle smaller than said first predetermined angle, said mandrel truncated conical outer surface positioned opposite said forward truncated conical inner surface of said annular die to provide a die gap therebetween which decreases inwardly to enhance extrusion initiation, said



mandrel provided with a centrally formed axial bore extending therethrough;

a pilot rod residing in said axial bore for relative reciprocal sliding movement with respect to the mandrel, said pilot rod provided with a cylindrical outer surface of constant diameter substantially equal to said tubing I.D. and smaller than the constant diameter of the rearward surface of said annular extrusion die by an amount substantially equal to said tubing wall thickness;

means for retracting the pilot rod from said extrusion die during extrusion start-up and for extending the pilot rod a predetermined distance into the rearward portion of said annular extrusion die during extrusion to extrude said tubing with said wall thickness.

4,546,635
APPARATUS FOR FORMING GEARS

Masashi Arita, 1028-3725, Kaminakazato-cho, Isogo-ku, Yokohama-shi, Kanagawa-ken, and Shigeo Nakazawa, 617-45, Obuchi, Fuji-shi, Shizuoka-ken, both of Japan

Filed Jan. 10, 1983, Ser. No. 456,785

Claims priority, application Japan, Mar. 16, 1982, 57-40279

Int. Cl.[4] **B21C** *23/00*

U.S. Cl. 72—345 **4 Claims**

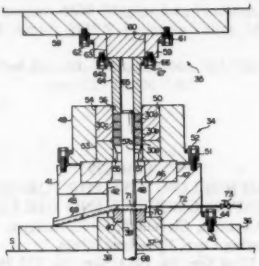
1. A gear-forming apparatus, comprising:

a die block formed with an axial bore and a plurality of teeth radially projecting into the bore and having lead-in portions adjacent one axial end of said bore;

a pressing member movable downwardly into and upwardly out of said bore through one axial end of said bore;

an elongated mandrel movable upwardly into and downwardly out of said bore through the other axial end of the bore; said pressing member and said elongated mandrel

being axially movable toward and away from each other; and



gear withdraw means adapted to remove and withdraw a gear from said mandrel.

4,546,636

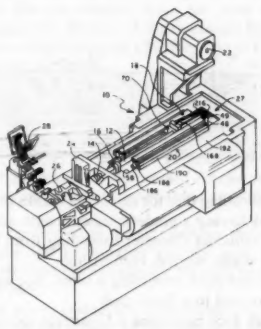
METHOD FOR PRODUCING SEAMLESS CONTAINER BODIES

Walter W. Snyder, Burleson, Tex., and Dennis G. Dettmer, Naperville, Ill., assignors to National Can Corporation, Chicago, Ill.

Division of Ser. No. 477,372, Mar. 21, 1983,. This application Apr. 4, 1985, Ser. No. 720,027

Int. Cl.⁴ B21D *45/00*

U.S. Cl. 72—346 **10 Claims**



1. A method of high-speed production of elongated ironed container bodies having relatively consistent sidewall lengths formed from a relatively shallow metal cup having an endwall and sidewall comprising the steps of:

reciprocally and axially moving a ram through a forward and rearward stroke, said ram having a rearward end and a forward end which during said forward stroke is driven axially into a die means including a least one ironing die, said forward ram end being withdrawn from said die assembly on said rearward stroke,

individually feeding said cups into the path of said ram stroke, said ram during its forward stroke engaging one of said individually-fed cups with said forward end of said ram before said ram enters said die means,

ironing said cup engaged on said ram by forcing said cup through said die means to reduce the thickness of said sidewalls and increase the length therof to form over said ram an elongated ironed container body,

supporting and critically aligning said ram at all times at at least three points prior to said ram's entrance into said die means, a first of said support means including a slideable ram block assembly slideably-mounted within a slideway and connected to the rear end of the ram and moveable therewith during said ram strokes, said connection between said ram and said ram block assembly being of a rigid nature to support and maintain critical alignment of said ram at all times during said rearward and forward strokes,

a second and third of said support means comprising axially-spaced stationary supports and critical alignment means, said stationary support and alignment means being positioned between said die assembly and said rearward end of said ram, said stationary support and alignment means and said slideable support and alignment means attached to said rearward end of said ram providing and maintaining critical alignment of said ram during all parts of said strokes to thereby prevent ram misalignment causing said cup sidewalls to be formed by said die means into an elongated container body having overly-inconsistent sidewall lengths, and;

removing said formed container body from said ram.

4,546,637

BLIND-RIVET SETTING TOOL

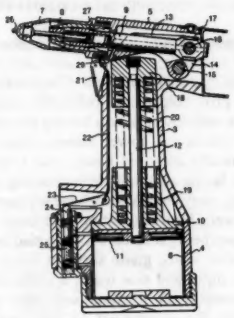
Anthony J. Elias, Bondi Junction, Australia, assignor to Spurway Cooke Industries Pty., Ltd., Victoria, Australia

Filed Nov. 10, 1983, Ser. No. 550,258

Claims priority, application Australia, Nov. 18, 1982, PF6868

Int. Cl.⁴ B21D *31/00*

U.S. Cl. 72—391 **7 Claims**



1. A blind-rivet setting tool comprising:

(a) a hollow columnar handpiece having a lower end formed as a working cylinder and having a tubular barrel disposed athwart its upper end;

(b) a cylinder head disposed athwart the interior of said handpiece defining the upper end of said cylinder;

(c) one but not more than one piston in said cylinder;

(d) a rivet-pulling plunger movable longitudinally within said barrel and having one end adjacent an open end of said barrel therewith to constitute a rivet nail-stem chuck;

(e) a piston rod disposed inside said handpiece and having said piston secured to its lower end and having its upper end positioned in or adjacent said barrel;

(f) transmission mechanism whereby upward movement of said piston rod causes said plunger to recede away from the open end of said barrel, thereby causing said plunger to execute a rivet-setting, working stroke;

(g) control means whereby working fluid is admitted to said cylinder for performance of working and return strokes of said piston; and

(h) resilient loading means operatively associated with said piston rod and cylinder head for urging upward movement of said piston rod, which loading means are strained so as to store energy during each return stroke and relax

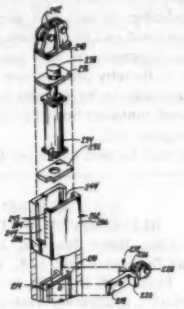
during each working stroke to deliver energy to said piston rod.

4,546,638

APPARATUS FOR REPAIRING AND STRAIGHTENING VEHICLES

Carl R. Field, Des Moines, Iowa, assignor to Duz-Mor, Inc., Des Moines, Iowa

Filed Dec. 20, 1982, Ser. No. 433,843
Int. Cl.[4] B21D *1/12*
U.S. Cl. 72—455 **9 Claims**



9. Apparatus for repairing and straightening vehicles comprising:

vehicle supporting means for receivingly supporting the wheels of a vehicle;

tower means operably attached to said vehicle supporting means for providing anchor points for pulling against auto body parts, said tower means having an upper portion and a lower portion, said tower means comprising a substantially vertically disposed beam, said beam including an inner wall facing said vehicle supporting means, an outer wall facing away from said vehicle supporting means, and two side walls interconnecting said inner wall and outer wall, a space being formed between said inner wall, outer wall and side walls, guide surfaces being formed within said inner, outer and side walls, a vertically oriented slot being disposed in and through said inner wall;

flexible means for attachment to said tower at one end thereof and to a vehicle body part on the other end thereof for pulling on such auto body part, said flexible means being tensionable;

holding means operably attached to said outer wall for attaching said one end of the flexible means thereto;

first guide roller means operably attached to a top portion of said beam for receivingly guiding said flexible means over the top of said beam;

hydraulic cylinder means fixed on one end thereof with respect to said beam for selectively varying the distance between said roller means and said flexible holding means to selectively exert a pulling force on the other end of said flexible means;

second guide roller means for receivingly guiding said flexible means;

bracket means for rotatably attaching said second roller means to said beam;

extension means connected to said bracket means and extending through the slot in said inner wall of the beam;

guide means disposed inside of said inner, outer and side walls of said beam for cooperating with said guide surfaces, said guide means being connected to said extension means for permitting said extension means and bracket means to be vertically moved with respect to said beam; and

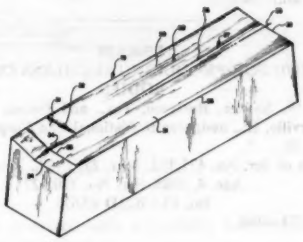
locking means for selectively locking said guide means in any one of a number of vertically spaced positions.

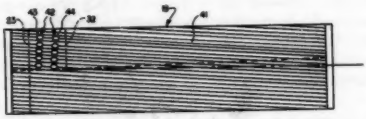
4,546,639

THREAD ROLLING DIES FOR FORMING SELF TAPPING SCREWS AND THE LIKE

Richard H. Corrette, Cleveland, Ohio, assignor to Colt Industries Operating Corp, Cleveland, Ohio

Filed Sep. 26, 1983, Ser. No. 535,796
Int. Cl.[4] B21H *3/06*
U.S. Cl. 72—469 **4 Claims**





1. Thread rolling dies for threading blanks providing a cylindrical shank having a predetermined length and a tapered end portion of reducing diameter extending from one end of said cylindrical shank portion, comprising:

a pair of dies each providing a work face extending from a forward end to a finish end;

each work face providing a G-surface extending from said forward end to said finish end and a rise angle surface angulated up from said G-surface and intersecting said G-surface along a G-line extending lengthwise of said work face;

thread forming grooves formed lengthwise of said die along both of said G-surface and said rise angle surface providing grooves between crests;

said thread forming grooves along said G-surfaces operating to thread said cylindrical shank and said thread forming grooves along said rise angle surface operating to thread said tapered end portion;

said G-surface having a width at said forward end greater than said predetermined length and extending with progressively decreasing width toward said finish end; and

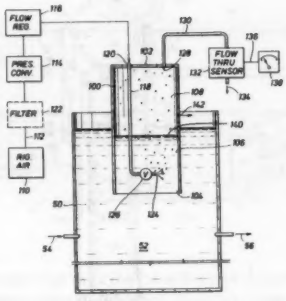
longitudinally short recesses on said rise angle surface extending inwardly from the roots of said grooves into which material of said tapered end portion is pressed to form radially extending lobes on said tapered end portion which extend peripherally around said tapered end portion substantially less than one revolution, said recesses being spaced from said finish end by a distance no more than twice the rolling diameter of said cylindrical shank.

4,546,640

POSITIVE AIR GAS DETECTOR

Richard J. Stone, 3426 Covey Trail, Missouri City, Tex. 77459; Luther H. Dunegan, 4630 Bagpipe La., Houston, Tex. 77084, and George E. Smith, 2115 S. Fountain Valley, Missouri City, Tex. 77459

Filed Jun. 13, 1983, Ser. No. 503,726
Int. Cl.[4] G01N *7/00*
U.S. Cl. 73—19 **16 Claims**



1. A gas detector apparatus for sensing the amount of gas present in a reservoir of heavy viscous material, comprising:

a container positioned with the reservoir, said container being open at the bottom and closed at the top, the walls of said container at the bottom being below the surface of the viscous material and apart from the bottom of the reservoir so that the material from the reservoir freely enters the container, the top of the container being above the surface to establish an air chamber above the surface of the reservoir material;

an input tube with a spout located within the container below the surface of the viscous material;

constant air pressure means connected to the inlet opening of said tube to cause air flow agitation of the viscous material within fhe container to dislodge residual gas therefrom whereby the gas and said compressed air rise and accululate in said air chamber at higher than atmospheric pressure; and

an output tube connected to the air chamber through a first vent, whereby the pressurized gas and said air within within said air chamber are ejected through said vent and output tube; and

a flow-through sensor connected downstream to said output tube for sensing gas present in the sample of air from the air chamber.

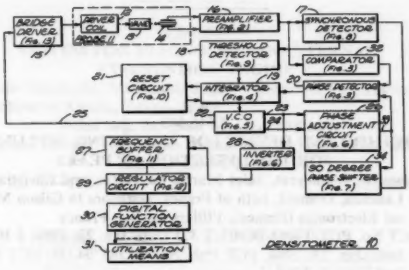
4,546,641

DENSITOMETER

Van H. Nguyen, San Gabriel, Calif., assignor to International Telephone & Telegraph Corp., New York, N.Y.

Filed Oct. 17, 1983, Ser. No. 542,836
Int. Cl.[4] G01N *9/00*
U.S. Cl. 73—32 A **4 Claims**

1. A vibration densitometer comprising: a probe; a vibratable vane supported in said probe; electromagnetic means to cause said vane to vibrate; a sensor to produce an alternating electrical output signal of a frequency which is a function of the density d of the fluid surrounding said probe; a preamplifier connected from said sensor; a synchronous detector connected from said preamplifier; a phase detector having first and second inputs, said first input being connected from said preamplifier; an integrator, said phase detector having an output; an electronic switch connected from said phase detector output to said integrator; a threshold detector connected from said synchronous detector to said electronic switch; a voltage controlled oscillator (VCO) having an input connected from said integrator; first output means; a phase shifter connected from said first output means to said synchronous detector; a driver connected from said VCO to said electromagnetic means; a buffer having an input connected from said first output means and an output; and second output means responsive to the



output of said buffer for producing a signal of a magnitude directly proportional to the said density d,

where $d = AT^2 + B$,

A is a constant,

B is a constant,

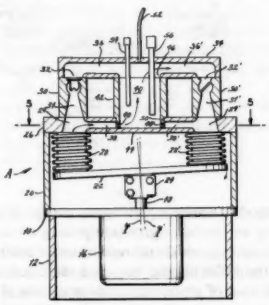
T is the period of the output signal of said buffer.

4,546,642

ACCELERATED HEART VALVE TESTING APPARATUS AND METHODS

Wilbur M. Swanson, St. Louis County, Mo., assignor to Dynatek, Inc., St. Louis, Mo.

Filed Aug. 17, 1984, Ser. No. 641,870
Int. Cl.[4] G01N *3/36*
U.S. Cl. 73—37 **14 Claims**



1. Valve testing apparatus for testing of check valves such as prosthetic heart valves by application of repeated oscillatory flows produced by fluid motion relative to the valves, said apparatus comprising chamber means for receiving a plurality of test samples comprising valves to be tested, said chamber means defining fluid flow passages communicating with the valves for directing an oscillating flow of fluid to said test samples, at least first and second bellows respectively connected with the fluid flow passages, and a swash plate carrying the bellows, means for rotatably driving the swash plate for producing rotatably tilting oscillatory movement of the bellows, and a further fluid passage connecting the test samples for providing a fluid path extending between the bellows and including bypass passage means for receiving fluid from each of the passages respectively communicating with the bellows, and bypass flow control means, for selectively permitting the fluid to bypass the respective test valves through the bypass

passages means thereby to control the fluid pressure to which the valves undergoing testing are exposed.

4,546,643

METHOD AND DEVICE FOR ANALYZING EFFLUENTS FOR THE DETECTION OF PEAKS

Alain M. Bonneyrat, Saint Martin du Tertre, and Christian L. Lanclais, Domont, both of France, assignors to Gilson Medical Electronics (France), Villiers Le Bel, France

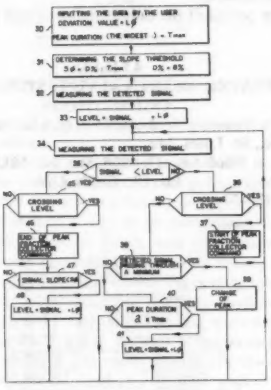
PCT No. PCT/FR83/00107, § 371 Date Jan. 23, 1984, § 102(e) Date Jan. 23, 1984, PCT Pub. No. WO83/04325, PCT Pub. Date Jun. 2, 1983

PCT Filed Jun. 2, 1983, Ser. No. 577,629

Claims priority, application France, Jun. 3, 1982, 82/09675

Int. Cl.[4] G01N *31/08*

U.S. Cl. 73—61.1 C **10 Claims**



1. In a method of analysing effluents comprising the step of

(a) detecting an electric signal comprising a baseline having peaks, certain of which represent useful information concerning the effluent, the detected electrical signal being representative of a physical and/or chemical property of the effluent as a function of time, and

(b) analysing the detected electrical signal in order to select useful peaks of said detected electrical signal, the improvement wherein said step (b) of analysing the detected electrical signal comprises the following operations:

(b1) defining a deviation value (Lϕ) and defining a slope threshold value (Sϕ)

(b2) comparing the slope of the detected signal with the slope threshold value (Sϕ)

(b3) defining a pilot signal by summing up a value of the detected electrical signal and the deviation value (Lϕ), if the slope of the detected electrical signal is lower than the slope threshold value (Sϕ),

(b4) limiting the evolution of the pilot signal when the slope of the detected signal is higher than the slope threshold value (Sϕ), and

(b5) selecting as a useful peak the consecutive values of the detected electrical signal which exceed the level of the pilot signal.

4,546,644

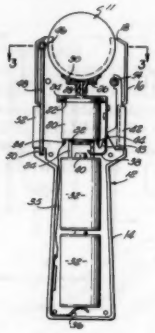
METHOD AND APPARATUS FOR LOCATING THE DYNAMIC AXIS OF A SPHERE

Janos Beny, 3202 Singingwood Dr., Torrance, Calif. 90505, and David E. Tompkins, 705 Pruitt Dr., Redondo Beach, Calif. 90278

Filed Jan. 9, 1984, Ser. No. 569,121

Int. Cl.[4] G01M *1/26*

U.S. Cl. 73—65 **7 Claims**



1. An apparatus for locating the orientation of a golf ball for substantially true-roll stroking, comprising:

a cup support means defining a bearing surface to engagingly receive said golf ball for substantially free movement thereon;

housing means for supporting said cup for rotation and defining an opening for receiving said cup support means in radially symmetrical relationship whereby at least an upper portion of said golf ball is accessible for marking; and

motor means fixed in said housing means for rotating said cup support means with said golf ball thereon to spin said golf ball into stable alignment for marking.

5. A method for testing and marking a golf ball, comprising the steps of:

supporting the golf ball for substantially free rotation about any axis containing its geometric center;

imparting a spin to said golf ball about a spin axis containing the geometric center of the golf ball to thereby cause eccentricity of the golf ball to move it toward an equilibrium position in response to forces induced by said spin; and

marking the golf ball to identify a plane perpendicular to the spin axis in the equilibrium position for reference in stroking the golf ball.

4,546,645

MEASURING DEVICE FOR THE MOISTURE CONTENT OF GRANULAR MATERIALS

Jean P. Delmulle, Hauville, and Bernard Torchet, Blois, both of France, assignors to L'Etat Francais représenté par le Ministère de l'Urbanisme et du Logement, Laboratoire Central des Ponts et Chaussees, Paris, France

Filed May 20, 1983, Ser. No. 496,625

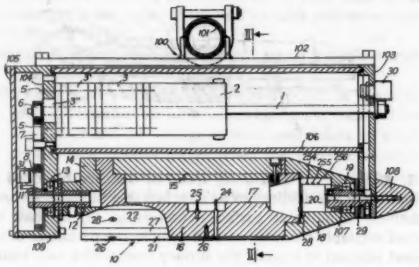
Claims priority, application France, May 26, 1982, 82 09168

Int. Cl.[4] G01R *27/26*

U.S. Cl. 73—74 **11 Claims**

1. Device for measuring the moisture content of at least one of a granular and a powder material, particularly materials in movement on a conveyor belt or in a pipe, of the type comprising a capacitative probe provided with at least two externally mounted electrodes separated by an insulating zone and in contact with the material being examined, the said probe having a cylindrical body, a support frame for the capacitative

probe, and a high frequency oscillator circuit associated with the electrodes in order to provide an alternating voltage of frequency variable with the moisture content, said device further comprising means for rotating the probe with respect to the frame intermittently at predetermined regular intervals for a limited time and cleaning means mounted on the frame



and cooperating with the cylindrical body of the probe during the rotary movements of the latter, to remove material which has adhered to the probe, and means for measuring the moisture content of the material examined continously when the probe is in a resting position between said predetermined intervals of rotation for cleaning.

4,546,646

SYSTEM FOR DIAGNOSING AN INTERNAL COMBUSTION ENGINE

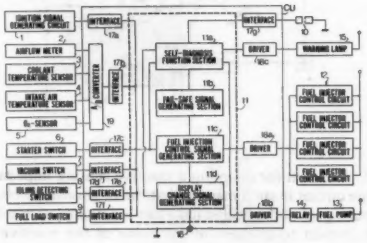
Toshio Takahashi, Tokyo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1983, Ser. No. 535,477

Claims priority, application Japan, Oct. 1, 1982, 57-173625; Oct. 1, 1982, 57-173626

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—117.3 **13 Claims**



1. A system for diagnosing operations of sensing systems of an internal combustion engine comprising:

a first diagnosing circuit for diagnosing operation of a first of said sensing systems, said first diagnosing circuit including comparing means for comparing an input from said first sensing system with a reference and said first diagnosing circuit for producing a first output when the input is different than said reference;

means comprising a display responsive to said first output for indicating trouble in said first sensing system;

a second diagnosing circuit for diagnosing operation of a second of said sensing systems and for producing a second output when the operation of the second sensing system is abnormal;

gate means for electrically connecting the second output of said second diagnosing circuit with said display;

a manually operated terminal for producing a third output when operated; and

control means responsive to the third output for opening said gate means so as to apply an occurrence of said second output to the display to indicate abnormality of the diagnosing of said second diagnosing circuit.

4,546,647

SYSTEM FOR DIAGNOSING AN INTERNAL COMBUSTION ENGINE

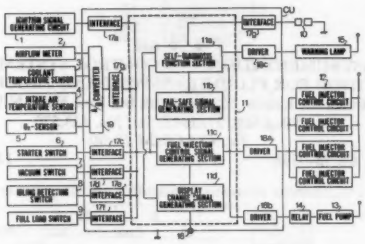
Toshio Takahashi, Mitakashi, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1983, Ser. No. 535,486

Claims priority, application Japan, Sep. 30, 1982, 57-171506

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—118 **16 Claims**



3. In a system for diagnosing an internal combustion engine having an air-flow meter, said air-flow meter comprising a variable resistor responsive to the volume of the intake air to the engine for producing an output voltage, the improvement comprising

a smoothing capacitor for filtering said output voltage producing an output voltage at said capacitor;

discharge means comprising another resistor connected in parallel to said smoothing capacitor for discharging the capacitor upon a fault with respect to said air-flow meter, and

means comprising a diagnosing circuit for producing a diagnosis signal when said output voltage at said capacitor decreases to a predetermined level.

4,546,648

ARRANGEMENT FOR MEASURING INJECTION QUANTITIES

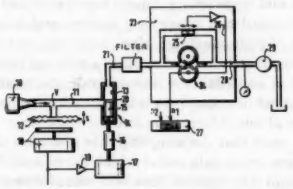
Jürgen Abt, Gerlingen; Dieter Handtmann, Sindelfingen; Reinhard Schwartz, Stuttgart, and Bertold Wocher, Leonberg, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 14, 1983, Ser. No. 542,070

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1982, 3238107; Jan. 22, 1983, 3302059

Int. Cl.[4] G01M *15/00*

U.S. Cl. 73—119 A **13 Claims**



1. An arrangement for measuring the injection quantity, the injection beginning and the injection end of individual injec-

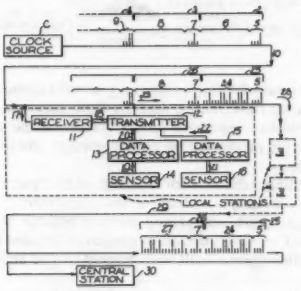
tions of an intermittently operating injection pump, comprising means forming an injection chamber; an adjustable throttle arranged at one location of said injection chamber so as to close the latter and including a throttle piston with a spindle; a movable wall arranged at another location of said injection chamber and limiting the same with a counterforce, said movable wall being formed as a wave siphon diaphragm which is deflectable; a path sensor arranged for sensing a position of said movable wall and supplying a signal for adjusting of said throttle; and means adjusting said throttle in response to said signal, said adjusting means including an electric variable speed motor which receives an electrical signal corresponding to the deflection of said wave siphon diaphragm and drives said spindle connected with said throttle piston.

4,546,649

INSTRUMENTATION AND CONTROL SYSTEM AND METHOD FOR FLUID TRANSPORT AND PROCESSING

Frederick W. Kantor, 523 W. 112th St., New York, N.Y. 10025

Filed Sep. 27, 1982, Ser. No. 423,570
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—168 **12 Claims**



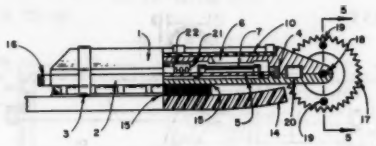
1. In an elongated data transmission system having a plurality of measurement stations spaced along a transmission line, a monitoring station, means for communicating along said transmission line data collected at said measurement stations, means for inserting measurement information from each of said measurement stations into said transmission line, and means in said monitoring station for receiving said information, wherein the transmission line has a speed of propagation and a length such that the delay time to said monitoring station from the most remote of said measurement stations is significantly longer than the time required for each measurement information inserting means to insert said information into said transmission line; the improvement wherein said communicating means includes a sampling signal source for applying repetitive sampling signal bursts to said transmission line to travel past said measurement stations toward said monitoring station, each burst including a plurality of code-identified blank intervals, and means at each measurement station for detecting a selected one of said blank intervals in accordance with said code; each said information measurement inserting means being operative to insert at least a portion of said information into the respective said one blank interval, such that the sampling rate at which said measuring stations can insert data and at which the monitoring station can receive said information from said measurement stations does not depend on the distance along said transmission but instead depends on the rate of repetition of the code-identified blank intervals of said sampling signal.

4,546,650

SPEED AND DISTANCE CALCULATOR FOR SKIS

John F. Cameron, 2048 Marich Way, Mountain View, Calif. 94040

Filed Sep. 23, 1983, Ser. No. 535,331
Int. Cl.[4] A63C *11/00*; G01P *1/00*
U.S. Cl. 73—490 **11 Claims**



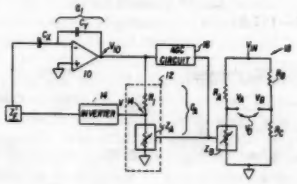
1. A device for measuring speed or distance travelled between a vehicle adapted to be attached to a human foot and a relatively immovable surface, comprising: (a) at least one wheel rotatably mounted on said vehicle, the perimeter of said wheel adapted to contact the surface over which said vehicle is moving, thus causing said wheel to rotate; (b) a base on which said wheel is mounted for rotation; (c) means on the base for sensing and counting the number of revolutions of said wheel in point of time for calculating speed or distance of movement of said vehicle over said surface wherein said sensing or counting means are powered by a power source other than said wheel; (d) means for storing information representative of said speed or distance; and (e) means for selectively displaying said stored information.

4,546,651

TRANSDUCER COUPLING

Edwin B. Merrick, Stow, Mass., assignor to Hewlett-Packard Co., Palo Alto, Calif.

Filed Apr. 2, 1984, Ser. No. 595,756
Int. Cl.[4] G01L *9/12*
U.S. Cl. 73—701 **15 Claims**



11. A circuit for coupling a reactive sensing impedance to a bridge circuit in such manner that the relationship between the output signal of the bridge has a desired degree of non-linearity with respect to changes in the value of the reactive sensing impedance caused by a phenomenon of interest, comprising

a loop including amplifying means contributing a gain of G_1 to the loop, means for coupling said reactive sensing impedance to said loop in such manner as to contribute a gain of G_2 to the loop, there being a given value of G_2 when the sensing impedance is free from the effect of the phenomenon of interest, and gain control means having a variable element connected to predetermined points thereof, said gain control means contributing a gain of G_3 to the loop, there being a given value of G_3 when said reactive sensing impedance is free from the effect of the phenomenon of interest, the product of G_1, the given value of G_2 and the given value of G_3 being unity so that said loop oscillates at a frequency determined by circuit components included in said loop,

an automatic gain control circuit coupled to said loop for producing a gain control signal related to the amplitude of the oscillations in the loop,

means coupling said gain control signal to said variable element of said gain control means so as to cause it to change G_3 in such direction as to compensate for any changes that may be brought about in G_2 by changes in the value of the sensing impedance and thereby keep the gain of the loop at unity,

a resistive bridge circuit having variable resistance means connected between points therein in such manner that changes in the value of the said variable resistance unbalance the bridge,

means coupling said gain control signal to said variable resistance so as to vary its value, and

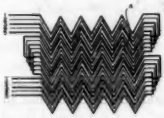
the ratio of the voltage between said points in the bridge circuit when said variable resistive means is removed from the circuit and the voltage between said points for a value of the gain control signal when the variable resistance means is connected in the bridge circuit is $1/G_3$, the latter value of G_3 occurring in response to the latter gain control signal.

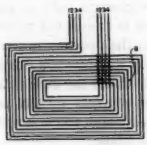
4,546,652

IN-SITU ON-LINE STRUCTURAL FAILURE DETECTION SYSTEM, ITS PREPARATION AND OPERATION

Anil V. Virkar, Salt Lake City, and Ram Natesh, Centerville, both of Utah, assignors to Materials Research, Inc., Centerville, Utah

Filed Dec. 22, 1981, Ser. No. 333,480
Int. Cl.[4] G01B *21/00*
U.S. Cl. 73—776 **19 Claims**





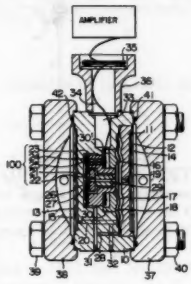
1. An in-situ on-line structural failure detection system for use in detecting cracks in metal structures which comprises a thin film adhesively bonded to the metal structural surface to be monitored, said film containing a plurality of thin continuous metal strips which are adapted to be broken when a crack appears under the strips, said strips being substantially parallel but insulated from each other and the metal structural surface and arranged in a pattern such that there is frequent change in direction of the strips as in a zig-zag or rectangular pattern, each of said strips constituting a separate circuit joined to an electric power source and a sensing and recording means capable of detecting and recording any circuit failure which may be caused by disruption of the metal strips.

4,546,653

SEMICONDUCTOR DIFFERENTIAL PRESSURE TRANSDUCER

Tomoyuki Tobita, Katsuta; Yoshimi Yamamoto; Akira Nagasu, both of Ibaraki, and Yukio Takahashi, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 3, 1984, Ser. No. 606,993
Claims priority, application Japan, May 4, 1983, 58-78601
Int. Cl.[4] G01L *7/08, 9/00*
U.S. Cl. 73—720 **7 Claims**



1. A semiconductor differential pressure transducer comprising:

a pressure receiving part,

a pair of pressure receiving diaphragms forming first and second pressure receiving chambers at both sides of the pressure receiving part;

a compensating diaphragm forming first and second compensating chambers in said pressure receiving part;

a semiconductor differential pressure sensor forming first and second pressure measuring chambers in said pressure receiving part;

first and second pressure leading paths for enabling communication of said first pressure receiving chamber with said first compensating chamber and for enabling communication of said second pressure receiving chamber with said second compensating chamber, respectively, and

third and fourth pressure leading paths for enabling communication of said first compensating chamber with said first pressure measuring chamber and for enabling communication of said second compensating chamber with said second pressure measuring chamber, respectively;

said first pressure receiving chamber and said first pressure measuring chamber; and said second pressure receiving chamber and said second pressure measuring chamber communicating with each other through said first and second compensating chamber, respectively; said first compensating chamber and said first pressure measuring chamber being formed between said second compensating chamber and said second pressure measuring chamber.

4,546,654

IMPACT TESTING MACHINE

David P. Isherwood, Bradfield, and Hany R. Younan, London, both of England, assignors to National Research Development Corporation, London, England

Filed Sep. 1, 1983, Ser. No. 528,474
Claims priority, application United Kingdom, Sep. 2, 1982, 8224980
Int. Cl.[4] G01N *3/30*
U.S. Cl. 73—844 **2 Claims**

1. An impact testing machine comprising:

a pivoted arm;

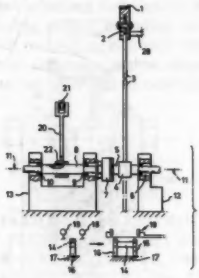
a striker held by said pivoted arm;

mounting means adapted to hold a specimen in the path of

said striker arm when said striker is moved by the pivoting of said pivoted arm;

motor means connected to said pivoted arm and to give said arm angular acceleration sufficient for said striker to reach a useful speed for impact testing within one revolution of said pivoted arm from stationary, and

clutch means to disengage said motor means from said pivoted arm after accelerating it and just before said striker meets a specimen when held by said mounting means,



said machine further including operating means for said clutch means adapted to engage said clutch means so that said pivoted arm is connected to said motor means only after said motor means has run up to speed,

said machine further including a lost-motion device connecting said motor means to said pivoted arm, whereby drive is not transmitted from said motor means to said pivoted arm simultaneously with the engagement of said clutch but only subsequently after said lost motion has been taken up.

4,546,655

FLOW MEASURING DEVICE WITH MULTIPLE-STATIC PRESSURE HOLES

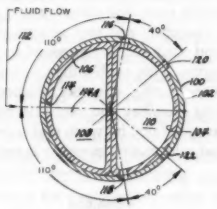
Michael Victor, 41227 I-94 X-Way Service Dr., Van Buren Township, Belleville, Mich. 48111

Continuation-in-part of Ser. No. 347,957, Feb. 11, 1982, Pat. No. 4,425,807. This application Oct. 13, 1983, Ser. No. 541,455

The portion of the term of this patent subsequent to Jan. 17, 2001, has been disclaimed.

Int. Cl.⁴ G01F *1/46*

U.S. Cl. 73—861.66 **11 Claims**



1. A flow-sensing tube means supported transversely to fluid flowing in a conduit for measuring differential flow pressure, comprising:

a hollow, elongated tubular member having a wall with a circular exterior cross section;

wall means in said tubular member forming a first chamber and a second chamber;

first flow-sensing opening means in the wall of said tubular member opening in a first radial direction and fluidly connected to the first chamber;

second flow-sensing opening means in the wall of said tubular member opening in a second radial direction and fluidly connected to the second chamber, the second opening means being disposed on a radial axis forming a first angle greater than 105 degrees but less than 115 degrees with respect to a radial axis passing through the first opening means;

third flow-sensing opening means in the wall of the tubular member opening in a third radial direction and fluidly connected to the second chamber, the third opening means being disposed on a radial axis forming an angle greater than said first angle with respect to the radial axis passing through the first opening means;

means for mounting the tubular member in the conduit in the path of fluid flow such that the first opening means faces upstream of the fluid flow; and

means for fluidly connecting each of said chambers to a measuring means.

4,546,656

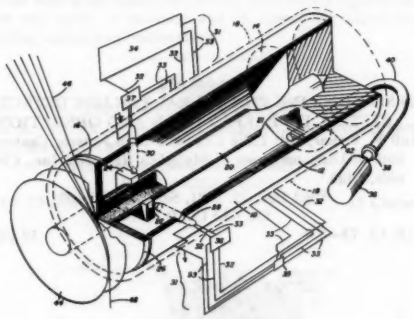
TENSION MEASURING DEVICE AND METHOD FOR FILAMENTARY MATERIAL

Reed H. Grundy, Murrysville, and James W. Koewing, Bethel Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 14, 1983, Ser. No. 561,612

Int. Cl.⁴ G01L *5/10*

U.S. Cl. 73—862.48 **25 Claims**



1. An apparatus for measuring the tension in continuously moving fibers and/or strand that is formed from a plurality of fibers, comprising:

a. a housing having a high resistance to the flow of heat that forms an enclosure with an opening at one end,

b. a team that is cantilever-mounted within said housing to extend near the opening in the housing, where the beam is substantially surrounded by the housing except for the opening in which the beam can radially deflect,

c. at least two target means located on the beam in the housing in relation to each other along two different axes in the same plane,

d. at least two sensing means mounted to extend through the housing so that each one sensing means is in sensing engagement with one of the target means to sense a cantilever deflection of the beam, where the sensing means are adapted to produce a signal in response to the deflection of the beam,

e. gas supply means connected to the housing to produce a flow of gas within the housing to exit through the opening in the housing in order to retard entrance of liquids into the housing,

f. strand engaging means mounted at the distal end of the beam away from the point of cantilever-mounting of the beam to the housing and beydnd the opening in the housing to allow the strand which is under tension to engage the beam to produce strand tension, force components to

deflect the beam and the target means on the beam which movement is sensed by the sensing means which produce a signal in response thereto,

g. a conducting means connected to the sensing means to permit the sensing means to initiate signals and to convey the signal produced by the sensing means, and

h. one or more indicating means to indicate the output from the signals of the sensing means which can be calculated into the magnitude of the tension and/or the coefficient of friction.

4,546,657

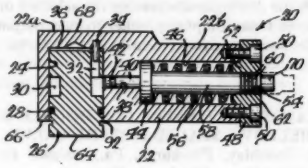
FORCE GAUGE

Ben E. Jaeger, Rte. 2, Box 49, Plano, Ill. 60545

Filed Jul. 23, 1984, Ser. No. 633,584

Int. Cl.[4] G01L *1/02*

U.S. Cl. 73—862.58 **20 Claims**



1. A gauge for measuring the force exerted by a gripping device, comprising an elongate housing having a first cylinder bore therein toward one end thereof extending generally perpendicularly of said housing between an open end on a surface of and a closed end in said housing; a first piston in and slidably sealed with said cylinder, said piston having an outer end extending out of said cylinder open end; fluid in said cylinder for being pressurized upon forceful movement of said piston into said cylinder; a second cylinder bore in and extending generally longitudinally along said housing in communication at one end thereof with said first cylinder and fluid therein; a second piston in and slidably sealed with said second cylinder, said second piston being moved through said second cylinder away from said first cylinder by pressure of said fluid upon forceful movement of said first piston into said first cylinder; and means for progressively resisting increasing movement of said second piston through said second cylinder, whereby when said first piston outer end and said housing are gripped by the gripping device, the amount of movement of said second piston through said second cylinder is in accordance with the force exerted by the gripping device.

4,546,658

PIEZOELECTRIC FORCE/PRESSURE SENSOR

Henry A. F. Rocha, and John D. Harnden, Jr., both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 24, 1984, Ser. No. 583,466

Int. Cl.[4] G01L *1/16*

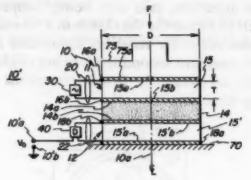
U.S. Cl. 73—862.59 **20 Claims**

1. A sensor for measuring the magnitude of a force or pressure incident thereon, comprising:

a resilient layer having first and second opposed surfaces;

first transducer means in abutment with said layer first surface for imparting mechanical vibration with a known frequency and amplitude to said layer; and

second transducer means in abutment with the remaining surface of said layer for receiving the vibratory motion transmitted through said layer and for converting the received amplitude of the vibratory motion to an output signal having the same frequency as the imparted vibration frequency and an amplitude responsive to the known amplitude of the mechanical vibration imparted to said first transducer and monotonically to the compression of



said layer and responsive to said force or pressure to be measured.

4,546,659

ATMOSPHERIC AIR SAMPLE COLLECTION DEVICE

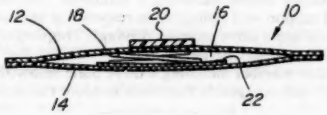
Bernard B. J. Gill, and Joseph L. P. M. Yergeau, both of Downsview, Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Apr. 5, 1984, Ser. No. 596,910

Claims priority, application Canada, Apr. 8, 1983, 425520

Int. Cl.[4] G01N *1/24*

U.S. Cl. 73—864.62 **8 Claims**



1. An envelope for the collection of atmospheric air samples, said envelope being formed of first and second opposed panels of flexible, gas impermeable material peripherally sealed to define a collection chamber therebetween said flexible, gas impermeable material being substantially inert to constituent components of an atmospheric air sample, said envelope containing expandable means movable from an original, compressed condition between said opposed panels to a subsequent, expanded condition whereby portions of said opposed panels are biased apart, a self-sealing septum associated with said first panel for use in selectively establishing fluid communication between the collection chamber and external atmospheric air whereby said expandable means moves from the compressed condition to an expanded condition and concurrently draws a sample of said external atmospheric air into said collection chamber, and a guard plate contained in said envelope between the expandable means and the second panel in a position subjacent the self-sealing septum.

4,546,660

EARTHQUAKE-RESPONSIVE VALVE MOTOR

Victor N. Bujold, 3415 Claremore, Long Beach, Calif. 90808

Filed Nov. 18, 1983, Ser. No. 553,136

Int. Cl.[4] F16K *17/36*

U.S. Cl. 74—2 **6 Claims**

1. A mechanism for translating earthquake motion into rotary motion comprising:

a support;

a rotor;

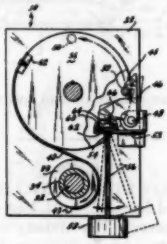
means for mounting the rotor on the support for rotational movement about an axis;

biasing means for biasing the rotor for rotational movement in one direction about said axis;

releasable locking means for locking the rotor against rotational movement in said one direction about said axis;

said releasable locking means including first and second

latches pivotally mounted on said support and a cam carried by the rotor, said first latch being engageable with the cam to lock the rotor against rotation about said axis in said one direction, said cam being cooperable with said first latch to rotate the first latch in a releasing direction to release the rotor for rotation about said axis in said one direction, and said second latch being engageable with the first latch to restrain the first latch against rotation in said releasing direction;



release means responsive to earthquake forces for pivoting said second latch in a direction to release said first latch whereby the rotor is released for rotation about said axis in said one direction;

said release means including a pendulum suspended from said support and swingable in response to said earthquake forces and a drive member drivingly coupling the pendulum to said second latch; and

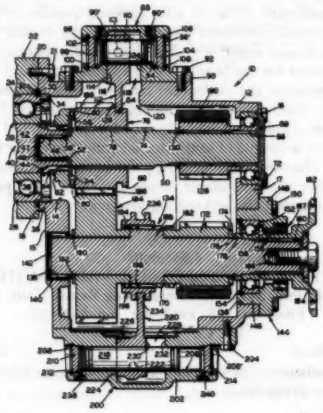
said drive member including a drive plate below the second latch and engageable therewith to pivot the second latch.

4,546,661

COUNTERSHAFT DRIVEN POWER TAKE-OFF

Philip J. Weis, Sylvania, Ohio, and Richard A. Cook, Gregory, Mich., assignors to Dana Corporation, Toledo, Ohio

Filed Jan. 9, 1984, Ser. No. 569,112
Int. Cl.[4] F16H *37/00*
U.S. Cl. 74—15.4 **1 Claim**



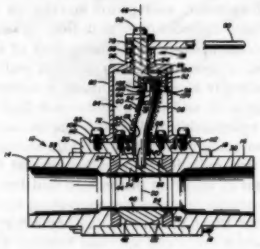
1. A power take-off unit to be driven by the rear end of a transmission countershaft, comprising a PTO housing adapted for connection to the rear end of the transmission case and to receive the rearward end of the transmission countershaft, an input shaft rotatably mounted in said PTO housing in a location coaxial with the countershaft, an output shaft rotatably mounted in said PTO housing parallel to said input shaft, an input gear mounted on the forward end of said input shaft for unitary rotation therewith and axial movement relative thereto, an output gear rotatably mounted on the forward end of said output shaft and directly meshed with said input gear so that said input and output gears form a gear drive first connection between said input and output shafts, first clutch means including a first clutch element adapted to be drivingly connected for unitary rotation to a rear end of the countershaft and a second clutch element which is formed as a part of said input gear, said first and second clutch elements being engaged upon forward movement of said input gear on said input shaft and becoming disengaged upon rearward movement of said input gear, an input sprocket mounted on said input shaft for unitary rotation at a location rearward of said input gear, an output sprocket rotatably mounted on said output shaft rearwardly of said output gear, a chain drive directly drivingly connected to said sprockets to form a second connection between said input and output shafts and second clutch means a mounted on said output shaft for drivingly connecting the selected one of said output gear and said output sprocket to said output shaft to provide a forward or reverse rotation of said output shaft.

4,546,662

ACTUATOR MECHANISM FOR DOUBLE BENT BELLOWS SEALED ROTARY VALVE

Richard P. Tremblay, Pittsburgh, Pa., assignor to Kerotest Manufacturing Corp., Pittsburgh, Pa.

Continuation of Ser. No. 357,284, Mar. 11, 1982, Pat. No. 4,468,002. This application May 14, 1984, Ser. No. 609,708
The portion of the term of this patent subsequent to Aug. 28, 2001, has been disclaimed.
Int. Cl.[4] F16K *41/10*
U.S. Cl. 74—18.1 **11 Claims**



1. An actuating device for movement of a member mounted in an enclosure comprising,

actuating means rotatable about an axis coaxially aligned with a member axis for moving said member,

a stem extending between said member and said actuating means,

said stem having a lower end portion in nonrotatable engagement with said member and an upper end portion connected to said actuating means for transmission of rotation from said actuating means to said member,

said stem lower end portion having a lower axis aligned with said member axis and said actuating means axis,

said stem upper end portion having an axis laterally displaced from and positioned parallel to said actuating means axis and said stem lower end portion axis to provide said stem with a bent configuration,

said stem upper end portion being orbited about said member axis as said actuating means is rotated to move said member,

a bellows surrounding said stem, said bellows having a lower end portion and an upper end portion,

means for sealingly connecting said bellows lower end por-

tion to said enclosure to provide a seal arond said stem lower end portion at said enclosure,

said stem being sealed at said upper end portion within said bellows so that said bellows forms a primary pressure boundary around said stem to contain internal pressure within said bellows and prevent leakage of fluid and pressure through said bellows,

said primary pressure boundary at said bellows upper end portion including a bellows cap received within said actuating means, said bellows cap positioned in spaced relation around said stem upper end portion,

said bellows upper end portion being sealingly connected to said bellows cap,

first bearing means for supporting said bellows cap on said stem upper end portion to permit rotation of said stem relative to said bellows cap, and

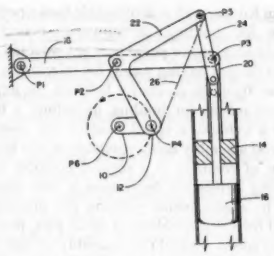
second bearing means retained in said actuating means for supporting said actuating means on said bellows cap to permit rotation of said actuating means relative to said bellows cap and transmit rotation from outside said primary pressure boundary through said second bearing means, said bellows cap, and said first bearing means to said stem in said primary pressure boundary.

4,546,663

DRIVE LINKAGE FOR STIRLING CYCLE AND OTHER MACHINES

James G. Wood, Athens, Ohio, assignor to Sunpower, Inc., Athens, Ohio

Filed Jun. 21, 1983, Ser. No. 506,313
Int. Cl.[4] F16H *21/32*
U.S. Cl. 74—40 **12 Claims**



1. A mechanical linkage for drivingly linking a body which is rotating with respect to a selected ground to a pair of bodies which are reciprocating with respect to said ground, said linkage comprising:

(a) a crank means connected to said rotating body and including a crank throw pin which moves in a circular path about the axis of rotation of said rotating body;

(b) a swing lever having at least 3 spaced pivot axes, said swing lever pivotally connected at a first one of its pivot axes to said ground and pivotally connected at a second one of its pivot axes to one of said reciprocating bodies; and

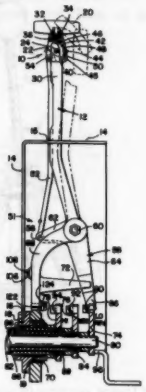
(c) a bell crank having at least 3 pivot axes arranged as apices of a triangle, said bell crank rotatably connected at a first one of its pivot axes to said crank throw pin, pivotally connected at a second one of its pivot axes to the other of said reciprocating bodies and pivotally connected at the third one of its pivot axes to the third pivot axis and said swing lever.

4,546,664

TRANSMISSION CONTROL ASSEMBLY

Richard H. Mylander, Glen Ellyn, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed Dec. 6, 1982, Ser. No. 446,921
Int. Cl.[4] B60K *20/04*; F16H *3/08*; F16D *31/02*
U.S. Cl. 74—473 R **1 Claim**



1. A range and speed transmission control assembly for a motor vehicle comprising a handle-lever assembly reciprocably movably mounted within a z-shaped slotted guide plate and operatively connected with a speed transmission control means of said control assembly secured to a speed shaft, a first linkage connecting a handle of said handle-lever to a gear selector mechanism for varying the range selection of the control assembly to a selected gear ratio, a second linkage means connecting the handle to a control plate, the operation of said second linkage means controls the speed of the vehicle, said handle including a pivotally mounted knob portion connected to said first linkage means for moving said first linkage means independently of said second linkage means, said z-shaped slot including one leg portion through which the handle-lever assembly moves for varying the speed of the vehicle, another leg portion through which the handle-lever assembly moves to engage the transmission range, and an intermediate portion which provides for range disengagement while maintaining a selected gear ratio whereby the range selection of the control assembly can be adjusted independently of the speed control mechanism and the speed control mechanism can be operated independently of the range control mechanism.

4,546,665

H-PATTERN SHIFTER FOR AUTOMATIC TRANSMISSIONS

William J. Bieber, Bieber Enterprises, Inc., 21901 Adler Dr., California City, Calif. 93505

Filed Nov. 9, 1983, Ser. No. 549,883
Int. Cl.[4] B60K *20/04*
U.S. Cl. 74—473 R **23 Claims**

1. For use in a vehicle having an automatic transmission with Low, Second and Drive forward speed ranges, a shifter, comprising:

a frame adapted to be mounted on the floor of the vehicle,

a shift handle having an upper end projecting upwardly from said frame and having a depending lower portion,

means mounting said shift handle in said frame for multi-directional pivotal motion,

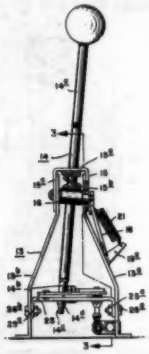
a gate plate mounted stationary in said frame and having a guide slot slidably receiving the lower portion of said handle for guiding the pivotal motion of said shift handle in a substantially H-shaped shift pattern,

first and second movable selector plates disposed in said frame adjacent to said gate plate,

linkage means in said frame coupling said selector plates for movement in unison but in opposite directions relative to one another,

surface means on said selector plates extending across portions of said guide slot and adapted to be selectively engaged by the lower portion of said shift handle for cooperating with said guide slot and said shift handle to displace said selector plates when said shift handle is pivoted, and

coupling means adapted to transmit motion of one of said selector plates to the transmission for shifting the same, whereby the shift lever causes both selector plates to move relative to the gate plate when engaged with the surface means and pivoted.



4,546,666

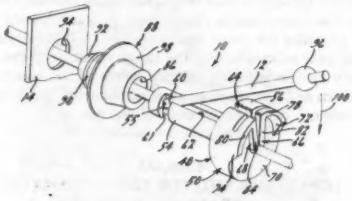
MOUNTING STRUCTURE FOR THROTTLE CONTROL CABLE

Nelson W. Secord, Brighton, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Oct. 9, 1984, Ser. No. 659,204

Int. Cl.⁴ F16G *1/14*

U.S. Cl. 74—501 P **6 Claims**



1. Mounting structure for throttle control cable comprising a cable retainer adapted for reception in an elastomeric grommet mounted on a throttle lever actuatable by a gas pedal, said cable retainer having a head portion including an obverse face and a reverse face, a tubular portion extending axially outwardly from the obverse face, said tubular portion defining a passageway which also exetnds entirely through the head portion, said passageway being for the reception of a throttle control cable, said tubular portion having a transverse slot intermediate the ends thereof communicating with said passageway, a first longitudinal slot in communication with said passageway extending from said transverse slot to the outer end of the tubular portion, a second longitudinal slot in communication with said passageway extending from said transverse slot to said head portion, said head portion having a slot extending from the outer periphery thereof into communication with said pasageway and second longitudinal slot whereby a flexible throttle control cable may be received in said passageway by first inserting a portion thereof through the transverse slot and then flexing the cable to pass through the first longitudinal slot, the second longitudinal slot and the slot in the head portion, said head portion having trap means on the reverse face thereof in alignment with the slot in the head portion permitting passage of the cable into said passageway but preventing passage of the cable out of said passageway.

4,546,667

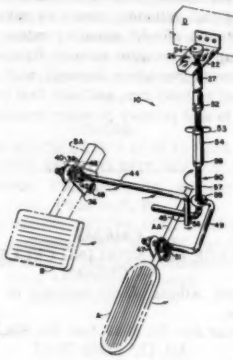
ADJUSTABLE AND RELEASABLE ACCELERATOR PEDAL DEPRESSOR SYSTEM

John H. Bopst, III, 409 Chalfonte Dr., Baltimore, Md. 21228

Filed Jan. 28, 1983, Ser. No. 462,092

Int. Cl.⁴ G05G *1/04, 1/14*

U.S. Cl. 74—526 **3 Claims**



1. In a system for use with a depressable brake pedal part and having means for holding an upwardly-biased pivotally mounted vehicle accelerator pedal part at a selected position of depression, and further having means for releasing a said accelerator pedal part from the means for holding, the improvement comprising: said means for holding including: a bracket for attachment to a vehicle, a speed control rod assembly, said speed control rod assembly being rotatable in said bracket from a first position of rotation to a second position of rotation, means permitting adjustable depression of said speed control rod assembly to a downward position for pressing down a portion thereof on a said accelerator pedal part, manual means for affixing said speed control rod assembly in said downward position by rotation of said speed control rod assembly to said first position of rotation, said means permitting adjustable depression permitting manual releasing of said speed control rod assembly from said downward position by rotation of said speed control rod assembly to said second position of rotation, further means for releasing said speed control rod assembly from said downward position by pedal depression of a said depressable brake pedal part, said speed control rod assembly being generally elongate with a rack portion along an upper part thereof, a catch on said bracket, said means for affixing said speed control rod assembly in downward position including means biasing said catch into engagement with said speed control rod assembly at said rack portion in said first position of rotation of said speed control rod assembly, said means permitting adjustable depression including a smooth portion of said speed control rod assembly for preventing said catch from engaging said speed control rod assembly in said second position of rotation permitting adjustable depression including said portion of the speed control rod assembly being an angled arm on the lower end of said speed control rod assembly in position for crossing over a said accelerator pedal part and for pressing

down thereon when the speed control rod assembly is in said first position of rotation, and said further means for releasing said speed control rod assembly including a horizontal rod with a downward end, means for adjustably clamping the horizontal rod to a brake pedal part with the downward end in position for rotating said angled arm to said second position for rotation upon said pedal depression of said depressable brake part.

4,546,668

POSITION ADJUSTMENT DEVICE

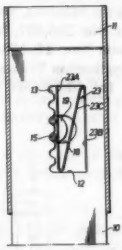
Lars B. E. Mattsson, Sävar, Sweden, assignor to Nystrom Nordpatent Aktiebolag, Umea, Sweden

Filed Apr. 12, 1983, Ser. No. 484,261

Claims priority, application Sweden, Apr. 13, 1982, 8202317

Int. Cl.⁴ G05G *5/06;* F16H *1/04;* F16M *11/04*

U.S. Cl. 74—531 **7 Claims**



1. A device for stepwise adjustment of the relative positions of two mutually displaceable members, said device comprising:

a first opening defined by one of said members;

a gear rack formed at one side of said first opening, said gear rack including a plurality of tooth gaps;

a second opening defined in each of two sides of the other of said members;

a pin gear mounted in each of said second openings and extending through said first opening, said pin gear having only two pin teeth cooperating with said gear rack, each of said two pin teeth being eccentrically mounted on said pin gear, said pin gear comprises a body, consisting of two portions being spaced apart opposite each other, securing means holding the two portions apart from one another form the two pin teeth of the pin gear, said pin gear including an operating means, having a gripping portion with two opposite gripping surfaces, each gripping surface located on one side of a plane through the axes of the two pin teeth, said pin gear being mounted in the other member to permit rotation thereof and to permit displacement thereof in a direction perpendicular to the longitudinal direction of the gear rack; and

means for spring-biasing the pin gear towards a locking position in which said two members are held against relative displacement by said two pin teeth simultaneously engaging said gear rack when each of said two pin teeth are located in one of two adjacent tooth gaps of the gear rack, said spring biasing means being located in said first opening, and in front of said two pin teeth, on the opposite side thereof with respect to the gear rack, and said spring-biasing means including a spring-force applying member bearing resiliently against said two pin teeth when the pin gear is in its locking position.

4,546,669

CONNECTING ROD MADE OF FIBER REINFORCED SYNTHETIC MATERIAL

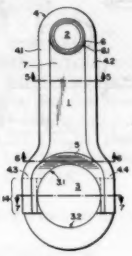
Thomas Fischer, Augsburg, and Bernd Bongers, Kirchheim, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Jun. 30, 1983, Ser. No. 509,782

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1982, 3225323

Int. Cl.⁴ F16C *7/02*

U.S. Cl. 74—579 E **9 Claims**



1. A connecting rod made of fiber reinforced synthetic material and having a longitudinal rod axis, comprising a first rod head at one end of the rod, said first rod head including a cylindrical closed bearing (6), a second rod head at the other end of the rod, said second rod head forming a divided bearing incldluing an inwardly disposed bearing bail (5) made of a material with unidirectionally oriented fiber strands extending substantially in longitudinal direction of said inwardly disposed bearing bail and an outwardly disposed bearing cover bail (3.2), said rod further comprising an open loop (4) also made of material with unidirectionally oriented fiber strands looping around said closed bearing and forming two loop legs (4.1, 4.2) having free ends reaching below a center of said second bearing, and a compression member (7) made of fiber strands oriented substantially in parallel to said longitudinal rod axis, said compression member (7) extending lengthwise between said closed bearing (6) and said inwardly disposed bearing bail (5) and laterally between said loop legs (4.1, 4.2), and first overlapping dovertailing means between said free loop leg ends and said outwardly disposed bearing cover bail for interconnecting the loop leg ends with the outwardly disposed bearing cover bail, said overlapping dovetailing means between said inwardly disposed bearing bail (5) and said outwardly disposed bearing cover bail (3.2) for interconnecting said inwardly and outwardly disposed bearing bails to each other, whereby said outwardly disposed bearing bail overlaps said free loop leg ends and said inwardly disposed bail for enclosing said second divided bearing (3) without any connecting bolts between said loop leg ends and said outwardly disposed bearing cover bail.

4,546,670

CONNECTING-ROD SYSTEM PARTICULARLY FOR MOWERS

Luigi Gaspardo, Via Mussons 7, Morsano Al Tagliamento (Pordenone), Italy

Filed Jan. 28, 1983, Ser. No. 462,008

Claims priority, application Italy, Mar. 16, 1982, 21152/82[U]

Int. Cl.⁴ F16C *3/06;* F16B *21/00;* F16D *1/00*

U.S. Cl. 74—595 **7 Claims**

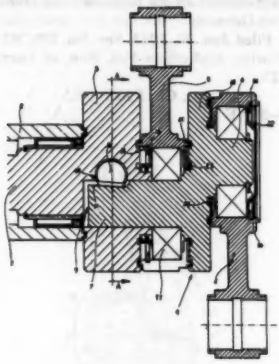
1. A connecting rod system particularly suited for mowers, comprising in combination,

a crank,

rods mounted on said crank for actuating elements driven by alternate motion,

a driveshaft including a head, the head of said driveshaft having a seat,

a crank pin for linking said crank to the head of said driveshaft, said crankpin including at least one inclined wall,



one end of said crank pin fitting into the seat of the head of said driveshaft,

a stop pin including an inclined wall which interacts with the inclined wall of said crankpin to properly position and clamp said crank pin in said seat.

4,546,671

VALVE ACTUATORS

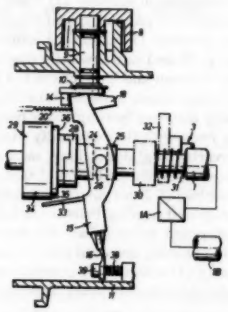
Jeremy J. Fry, Bath, England, assignor to Rotork Controls Limited, United Kingdom

Filed May 2, 1983, Ser. No. 490,714

Claims priority, application United Kingdom, May 12, 1982, 8213744

Int. Cl.[4] F16H *37/06*

U.S. Cl. 74—625 **7 Claims**



1. A valve actuator comprising an output shaft drivingly connectable to a valve, an electric motor for driving the output shaft, a drive transmission shaft through which the drive from said motor to said output shaft is transmitted, a reduction gearing connected between said drive transmission shaft and said output shaft, manual operating means for driving the output shaft manually, a drive transfer device for transferring the drive for the output shaft from the motor to the manual operating means, said drive transfer device including a clutch disposed in said drive transmission shaft on the high speed side of said reduction gearing for disengaging the drive from the motor and a gear for engaging the manual operating means to drivingly connect the manual operating means to the transmission shaft on the high speed side of the reduction gearing, the driven member of said clutch and said gear forming part of a unit which is slidable along said transmission shaft and keyed for rotation to it and which is biased to the clutch engaging position, and a manual operator for operating the drive transfer device to transfer the drive from the motor to the manual operating means, said manual operator comprising a pivotable yoke which engages said unit so that, upon pivotable movement of said yoke, said unit is caused to slide along said transmission shaft and which is provided with a hold-off finger which, when the clutch has fully disengaged, comes into engagement with a face of the driving member of the clutch to hold the clutch disengaged against the spring bias.

4,546,672

GEAR BOX FOR HIGH POWER VEHICLES

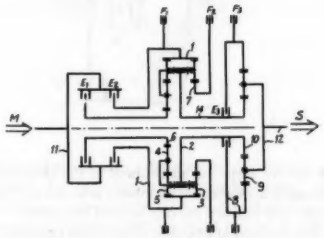
Pierre R. Leboime, Paris, France, assignor to Societe de Procedes et Etudes Soma Minerva, France

Continuation of Ser. No. 265,337, May 19, 1981, abandoned. This application Nov. 13, 1984, Ser. No. 670,680

Claims priority, application France, May 30, 1980, 80 12049

Int. Cl.[4] F16H *37/06*

U.S. Cl. 74—674 **5 Claims**



1. A change speed gear device comprising:

an input shaft for receiving rotational motion;

first gear train means having a first annulus, first and second planet wheel sets mounted on a first planet wheel carrier means, said first planet wheel set being meshed with said first annulus, first and second sun wheels meshed with said first and second planet wheel sets, said second planet wheel set being engaged between said second sunwheel and said first planet wheel set;

means for stopping said first sun wheel;

first and second clutch means coupled between said input shaft and said first annulus and said input shaft and said second sun wheel, respectively, for selectively driving said annulus and said second sun wheel;

means for stopping said annulus;

doubling train means comprising a third planet wheel set, including a second planet wheel carrier, third sun wheel and second annulus, said doubling train means further comprising means for stopping said second annulus and a third clutch means for selectively coupling said third sun wheel to said second annulus;

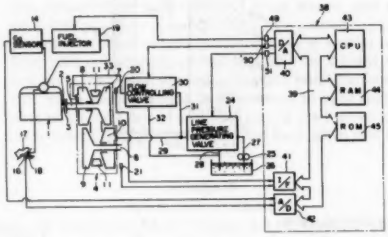
intermediate shaft means coupled to said first planet wheel carrier and said third sun wheel for transmitting rotational motion therebetween, said first planet wheel carrier and said first annulus being rotatable thereabout; and

an output shaft coupled to said said second planet wheel carrier, coaxial therewith and with said first and second sun wheels and coaxial with said intermediate shaft.

4,546,673
CONTROL FOR VEHICLE PROVIDED WITH CONTINUOUSLY VARIABLE SPEED SYSTEM POWER TRANSMISSION

Takashi Shigematsu, and Tomoyuki Watanabe, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Aug. 1, 1983, Ser. No. 519,149
Claims priority, application Japan, Aug. 4, 1982, 57-135147
Int. Cl.⁴ B60K *41/14*
U.S. Cl. 74—866 **4 Claims**



1. A control for a vehicle provided with:
(a) a continuously variable speed system power transmission which utilizes a continuously variable transmission comprising:
(i) a belt trained over a plurality of disks, at least one of said plurality of disks being movable to control the speed of the belt, and
(ii) a pressing force controlling means for controlling the force with which the belt presses against said disks in relation to acceleration fuel increments;
(b) an engine having a combustion chamber, said engine being operatively connected to said continuously variable transmission;
(c) a fuel injector operatively connected to said engine;
(d) an accelerator pedal operatively connected to said engine to control engine speed;
(e) an air-flow rate detecting means operatively connected to said fuel injector;
(f) a line pressure generating valve;
(g) a hydraulic pressure means operatively connected to said line pressure generating valve;
(h) a flow controlling valve operatively connected to said line pressure generating valve and to said pressing force controlling means;
(i) an electronic control unit having inputs from said engine and from said air-flow rate detecting means and outputs to said fuel injector, said flow controlling valve, and said line pressure generating valve;
(j) a torque sensor operatively connected to said engine and having an input to said electronic control unit;
(k) a rate of acceleration detecting means operatively connected to said accelerator pedal and having an input to said electronic control unit;
(l) a first angle sensor operatively connected to a first one of said plurality of disks mounted on a first shaft and having an input to said electronic control unit; and
(m) a second angle sensor operatively connected to a second one of said plurality of disks mounted on a second shaft and having an input to said electronic control unit,
said control comprising:
(n) a detecting means for detecting acceleration and deceleration intended by a driver;
(o) a computation means for figuring out desired air-fuel ratios in said combustion chamber and the desired speed ratios of said continuously variable transmission in relation to the output of said detecting means;
(p) a speed ratio controlling means for controlling the speed ratio of said continuously variable transmission such that the speed ratio of the continuously variable transmission becomes the desired speed ratio; and
(q) an air-fuel ratio controlling means for controlling the air-fuel ratio such that the air-fuel ratio in the combustion chamber becomes the desired air-fuel ratio, the air-fuel ratio being lowered together with the speed ratio of said continuously variable transmission during transient periods in which the input side rotational speed of said engine (Nin) does not equal the desired input side rotational speed of said engine (Nin*), the amount by which the air-fuel ratio is lowered being a function of the rotational speed of the engine.

4,546,674
METHOD FOR PROVIDING A TOOL FOR FORMING AN ARTICLE

Lonel L. Clark, 3712 Somerset La., Fort Worth, Tex. 76107, and Ronald H. Ellefson, 1411 Juanita Dr., Arlington, Tex. 76013

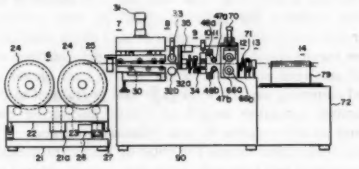
Division of Ser. No. 201,292, Oct. 21, 1980, abandoned. This application Mar. 21, 1983, Ser. No. 476,982
Int. Cl.⁴ B21K *5/20*
U.S. Cl. 76—107 R **4 Claims**

1. A method of providing a tool for forming an article comprising the steps of:
a. choosing a pattern of said article;
b. applying to said pattern a tooling surface;
c. applying to the back side of said tooling surface a reinforcing material consisting essentially of two components, the first component including:
i. a resin that will cure in the presence of a hardner to form a solid thermosetting plastic;
ii. a filler and thickening agent, and
iii. carbon fibers, and a second component including:
i. a hardener,
ii. said filler and thickening agent,
iii. poly vinyl alcohol fibers; and
d. applying to said tooling surface a primer coat of said second component and, thereafter,
e. applying a seal coat of said first component such that said resin, filler and thickening agent, carbon fibers and hardener are in respective proportion such that a solid, stiff backing results when applied to the back surface of the tooling surface;
f. finishing the tool by finishing said back side reinforcing material, including putting handles and the like thereon;
g. removing the finished tools; and
h. curing the finished tool for forming the article.

4,546,675
METHOD AND APPARATUS FOR PROCESSING TERMINAL OF INSULATOR COATED CABLES

Tokio Okada; Tsutomu Makino, and Michio Takemura, all of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

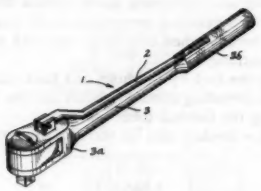
Continuation of Ser. No. 389,387, Jun. 17, 1982, abandoned. This application Sep. 11, 1984, Ser. No. 649,165
Claims priority, application Japan, Jun. 23, 1981, 56-96003
Int. Cl.⁴ H02G *1/12*
U.S. Cl. 81—9.51 **8 Claims**



1. An apparatus for pressing terminals of insulator coated cables, said apparatus comprising:

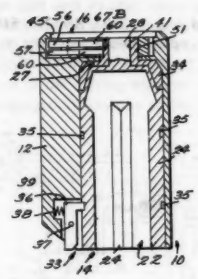
(a) a cable supply section for supplying cable;
(b) a straightening section for straightening sections of cable;
(c) a length measurement section for measuring lengths of cables;
(d) a circumferential cutting section for circumferentially cutting the insulator coated on the cable while the cable is temporarily stopped, said circumferential cutting section including:
(i) a disk-like cutting blade;
(ii) a pair of clamping rings mounted on a polygonal shaft, said pair of clamping rings clamping said cutting blades so as to prevent rotation of said cutting blades; and
(iii) a pair of rotary rings one of which is rotatably mounted on each of said clamping rings adjacent to said cutting blade, said rotary rings being sized and shaped so that an outer periphery portion of said cutting blade protrudes between said rotary rings by a prescribed cutting depth;
(e) a longitudinal cutting section for longitudinally cutting the insulator coated on the cable while the cable is moving longitudinally;
(f) a pull-out section provided adjacent to said longitudinal cutting section for pulling out the cable from said longitudinal cutting section; and
(g) means for severing the exposed conductors of the cable,
(h) said circumferential cutting section, said longitudinal cutting section, and said pull-out section being interrelated so that longitudinal slits in the insulator coated on the cable do not quite connect with circumferential slits in the insulator, whereby the slit end sections of the insulator remain united by a short non-cut longitudinal section.

4,546,676
TORQUE-MULTIPLYING HAND WRENCH
Walter J. Kiefer, Jr., Bothell, Wash., assignor to Kiefer Tool Co., Inc., Costa Mesa, Calif.
Filed Apr. 16, 1984, Ser. No. 600,887
Int. Cl.[4] B25B *13/00*
U.S. Cl. 81—58.1 **10 Claims**



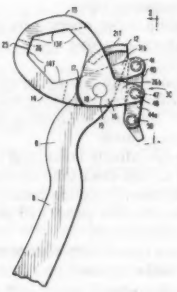
1. A torque-multiplying hand wrench, which comprises:
an elongate reaction arm having first and second ends;
a drive member;
drive member actuation means attached to said first end of said reaction arm for rotation about an axis substantially transverse to said arm, said drive member actuation means having a cam engaging portion offset from said axis for receiving a camming force;
cam means attached to said reaction arm adjacent to said drive member for rotation about an axis substantially parallel to the axis of rotation of said drive member, said cam means having an eccentric camming surface shaped and arranged so that rotation of said cam means causes said camming surface to engage said portion of said drive member actuation means to rotate said drive member about its axis relative to said reaction arm; and,
torque application means for rotating said cam means relative to said reaction arm, such that torque applied to said cam means is multiplied by the force moment exerted on said drive member by said camming surface acting on said cam engaging portion.

4,546,677
SLIP-ON SCREWDRIVER RATCHET
Ronald S. Berkich, R.D. #1, Leola, Pa. 17540
Filed Jul. 23, 1984, Ser. No. 633,351
Int. Cl.[4] B25B *13/46*
U.S. Cl. 81—62 **19 Claims**



1. In combination:
a fastener driver having a driver shank integral with an elongated handle; and
means for ready removable operative disposition with said handle for effecting ratchet action of said handle, said means comprising: an outer housing; an insert received within said outer housing and rotatable with respect to said outer housing, said insert dimensioned and shaped to receive said handle so that there is no relative rotation between said insert and said handle when said handle is engaged by said insert; and ratchet means acting between said housing and said insert for effecting rotation of said insert and said housing together in one direction of rotation, but not the other.

4,546,678
UNIVERSAL RATCHETING WRENCH
William C. Stuckey, 1503 Virginia St., Charleston, W. Va. 25311
Filed Dec. 30, 1983, Ser. No. 567,013
Int. Cl.[4] B25B *13/00*
U.S. Cl. 81—90.6 **6 Claims**



1. A universal ratcheting wrench comprising, in combination,
a pair of jaw elements, each having a pair of ends and a common pivot means therefor intermediate said ends, each said jaw element having an article engaging jaw on one of said ends, respectively,
a handle member, said handle member having a ratcheting jaw element integrally formed therewith, said handle being pivotally connected to said pair of jaw elements by

said common pivot means with said ratcheting jaw element movable between said pair of jaw elements,

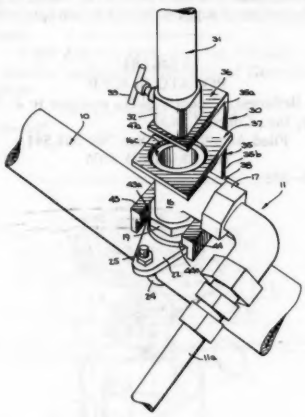
toggle linkage means for lockingly closing said pair of jaw elements relative to said ratcheting jaw element and an article on which said wrench is to be used, said toggle linkage means includes an extension link integral with a first of said pair of jaw elements and on an opposite end from said article engaging jaw on said first of said pair of jaw elements, the other of said pair of jaw elements having a further link extension integral with and on the opposite end from said article engaging jaw on said other of said jaw elements, an operating link member pivotally connected at one end to one of said extention links at a position spaced from said common pivot means, and a toggling link pivotally connected first by a second toggle link pivot to the other of said extension links at a point remote from said common pivot and secondly by a third toggle link pivotted to said operating link at a point thereon such that when said operating link is moved toward said common pivot, said pair of article engaging jaws move toward each other to encircle an article and lock when said toggle and aligned on said longitudinal axis of the tool for grasping and turning said tool to correspondingly turn its said wrench portion, the longitudinal spacing distance between said tool wrench portion and said tool gripper plate being greater than said distance between said upper and lower ends of said riser tee, a laterally projecting tool stabilizer plate on said tool body portion at a location between its said upper and lower ends and projecting in substantially the same lateral direction as said tool wrench portion and said tool gripper plate, said tool stabilizer plate being longitudinally spaced away from said tool wrench portion a distance which is less than said distance between said upper and lower ends of said riser tee and having means defining a circular aperture aligned on said tool axis and being larger than said riser tee upper end to receive the latter therein and providing a peripherally extending engagement surface for engaging said upper end of said riser tee when said tool wrench portion arm portions enqaqe said riser tee compression nut to turn the same.

4,546,679

RISER TEE WRENCH

Stanley M. Burghardt, 94-20 Plattwood Ave., Ozone Park, N.Y. 11417

Filed Sep. 12, 1983, Ser. No. 531,441
Int. Cl.[4] B25B *13/02*
U.S. Cl. 81—119 **4 Claims**



1. For disconnecting and connecting a riser service tee wherein the riser service tee has an upper end, and a lower end spaced a distance from, and aligned with said upper end along a vertical axis of said riser tee, said riser tee lower end having a threaded compression nut rotatably mounted thereon, a tool having a longitudinal axis for alignment with said riser tee axis, and comprising a tool body portion extending parallel to, but displaced laterally from said longitudinal axis of the tool and having respective upper and lower ends, a substantially U-shaped open-end wrench portion of said tool attached at the base of said U-shape to said lower end of said tool body portion and having parallel, spaced apart arm portions corresponding to the respective legs of said U-shape and which project laterally towards and beyond said longitudinal axis of the tool, said arm portions having respective middle length locations on respectively opposite sides of said longitudinal axis of the tool for engaging said riser tee compression nut to turn the same, a laterally projecting tool gripper plate on said upper end of said tool body portion, said tool gripper plate projecting in substantially the same lateral direction as said arm portions of said tool wrench portion and having gripper means projecting thereon

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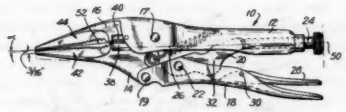
4,546,680

LONG NOSE LOCKING PLIERS

Christian Petersen, DeWitt, Nebr., assignor to Petersen Manufacturing Co., Inc., Dewitt, Nebr.

Filed Mar. 2, 1982, Ser. No. 353,860
Int. Cl.[4] B25B *7/12*
U.S. Cl. 81—367 **13 Claims**



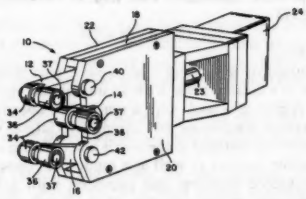
1. A long nose locking hand tool having a pair of opposing jaw members, a fixed handle and a movable handle and lever locking means therebetween for maintaining a toggle relationship between the jaws when in a closed position; and wherein each of said jaw members comprising a jaw face configuration having a total jaw length to average jaw height ratio of from about 6.5 to about 11.5 with a through jaw hardness range of from about 53 to about 57 Rockwell C, with said jaw members made of an alloy spring steel, said jaw members having a nominal parallel opening when they are spaced apart no greater than ¼ inch, thereby enabling said jaw members to clamp a workpiece with parallel jaw faces by flexing to the parallel condition when closed and returning to their original unstressed state when released of clamping pressure.

4,546,681

MULTI-PURPOSE STEADY REST

Paul J. Owsen, 1772 Indian Woods Dr., Traverse City, Mich. 49684

Filed Nov. 15, 1982, Ser. No. 441,702
Int. Cl.[4] B23B *25/00*
U.S. Cl. 82—38 R **5 Claims**



1. In a steady rest of the type including first and second elongate fingers having work contacting ends, control ends, pivoting means intermediate said ends, control means for piv-

oting the fingers between open and closed positions allowing a maximum or minimum diameter workpiece respectively, a center finger having a work contacting end and a control end, the center finger being slideably mounted between the first and second fingers with the control end in contact with said control means to be operated thereby, a first set of rollers having respective axes of rotation and mounted on the work contacting ends, the axes of said rollers being substantially parallel to one another and within the planes of the respective fingers thereof, wherein the improvement comprises:

a second set of rollers having respective axes of rotation, means mounting said second rollers axially adjacent respective first rollers for rotation about common axes and moveable therewith, all of said first and second rollers having the same diameter so as to allow both sets of rollers contact with an outer periphery of a workpiece and alternatively to allow the second set of rollers contact with an inner periphery of a workpiece.

4,546,682

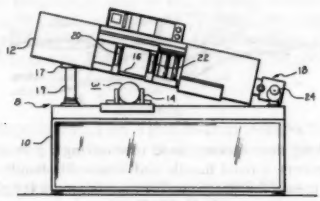
METHOD AND APPARATUS FOR OPERATING A BAND SAW

L. Brewster Howard, West Springfield, Mass., assignor to American Saw & Mfg. Company, East Longmeadow, Mass.

Continuation-in-part of Ser. No. 451,976, Dec. 21, 1982, abandoned. This application Sep. 10, 1984, Ser. No. 649,077

Int. Cl.⁴ B23D *53/04*

U.S. Cl. 83—13 **8 Claims**



6. Method of cutting a work piece with a band saw comprising the steps of fixing a work piece in a position to be cut by a longitudinally movable cutting span of the blade, driving the blade longitudinally and simultaneously tilting the blade in a cycle of oscillation relative to the work being cut, said cycle including movement first to one extreme angle of tilt and thereafter to an opposite extreme angle of tilt, the blade being tilted at its maximum rate of angular movement when it is being moved between said extreme angles and at its minimum rate when disposed at its extreme angles of tilt.

4,546,683

METHOD OF AND A CUTTING PRESS FOR SEPARATING PARTS FROM A WORKPIECE PLATE

Elmar Völkel, Kreiensen, and Walter Bredow, Alfeld, both of Fed. Rep. of Germany, assignors to Behrens AG, Alfeld, Fed. Rep. of Germany

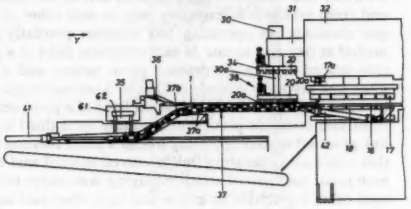
Filed Feb. 2, 1984, Ser. No. 576,527

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1983, 3311593

Int. Cl.⁴ B30B *9/00*

U.S. Cl. 83—27 **9 Claims**

1. A method of separating a workpiece part from a workpiece plate in a cutting press with an immovable support in an operating region of a tool, with a controlled coordinate table for a workpiece positioning and having two lateral workpiece supports movable parallel to the y-axis and defining a space for the immovable support as well as a guide rail connecting said lateral workpiece supports and provided with a transverse carriage movable in the direction of the x-axis and carrying clamping means for the workpiece plate, and with a central workpiece support located between the lateral workpiece supports before the immovable support and composed of a plurality of supporting elements displaceable in the direction of the y-axis from the immovable support so that a discharge opening is formed between the immovable support and a first supporting element facing thereto and openable for discharging the separated workpiece part of the previously withdrawn workpiece part or closable by return movement of the supporting elements the method comprising the steps of separating a respective workpiece part with the aid of a cutting tool so as to



retain at least one connecting web between separating edges of the workpiece plate and the workpiece part, the edges extending transverse to the direction of movement of the central workpiece support; positioning the workpiece plate and the workpiece part by the coordinate table above the discharge opening; and removing the connecting web after said positioning and before opening of the discharge opening, by displacing the central workpiece support from the workpiece part.

4,546,684

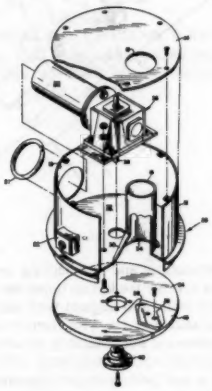
POTATO SLICER

Richard J. Bellerose, Concord, N.H., assignor to J. C. Pitman Company, Inc., Concord, N.H.

Filed Aug. 9, 1983, Ser. No. 521,591

Int. Cl.⁴ B26D *7/06*

U.S. Cl. 83—355 **3 Claims**



1. A potato slicing machine for use with a continuous fryer to produce potato chips comprising:

a housing having a top cover, a bottom cover, and upstanding side walls, the top cover having an entrance port therethrough and the bottom cover having an exit port therethrough;

a circular fly wheel rotatably mounted on said housing and disposed adjacent and below the bottom cover, said fly wheel having an eccentric opening therethrough and blade means for slicing potatoes mounted in the opening, the opening being rotationally disposed in registration with the exit port in the bottom cover so that as said fly

wheel rotates the opening and blade means pass under the exit port;

motor means including an axial shaft extending through the bottom cover and coupled to said fly wheel for driving said wheel, said motor means being disposed within said housing and extending through the side wall thereof; and tube means extending between the entrace port and the exit port for holding potatoes to be sliced, said tube means including wedge means adjacent the exit port for holding a potato being sliced in the exit port so that on each revolution a slice will be cut therefrom and dropped through the opening in the fly wheel, the exit port being substantially elliptical and having a long axis substantially equally radially spaced from the axis of rotation of said fly wheel, said tube and wedge means further comprising a conduit substantially circular in cross-section at the top and substantially elliptical in cross-section on the bottom connecting the entrance port and the exit port and extending through said housing, said ellipse being formed by a tapered side wall extending outwardly in the direction of rotation of said fly wheel so that as a potato is sliced the potato will be wedged against the tapered wall by the cutting action of the blade means.

4,546,685

DEVICE FOR SETTING THE THICKNESS OF CUT IN COLD MEAT SLICING MACHINES

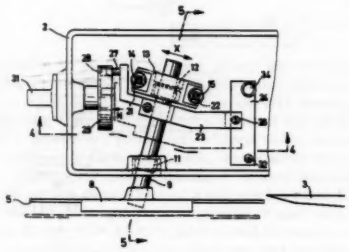
Albrecht Maurer, Balingen; Alois Butz, and Klaus Koch, both of Geislingen, all of Fed. Rep. of Germany, assignors to Bizerba-Werke Wilhelm Kraut GmbH & Co. KG, Balingen, Fed. Rep. of Germany

Filed Jan. 27, 1984, Ser. No. 574,663

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1983, 3304610

Int. Cl.⁴ B26D *7/06, 7/26*

U.S. Cl. 83—707 **5 Claims**



1. Device for setting the thickness of cut in cold meat slicing machines comprising a machine frame, a rotating circular cutter blade mounted for rotation in the machine frame, a carriage reciprocatable on the machine frame for depositing and advancing stock to be sliced, and a stop plate adjustable relative to the circular cutter blade to set the thickness of cut, with a level abutment surface for the stock to be sliced, characterized by the following features:

a. the stop plate (**5**) is rigidly connected to a guide axis (**9**) substantially transversely displaceable relative to its abutment surface (**6**);

b. the guide axis (**9**) is axially displaceable in two spherical bearings (**11, 12**) pivotably supported on the machine frame (**2**), and is

c. supported against rotation by a bracket (**23**) rigidly connected to the guide axis (**9**) and slidingly guided on the machine frame;

d. a mechanism (**28, 29, 31**) engages the bracket (**23**) to set the thickness of cut;

e. one of the spherical bearings (**12**) is adjustable in two directions (X, Y) extending substantially radially relative to the guide axis (**9**) in order to make the stop plate (**5**) and the circular cutter blade (**3**) parallel.

4,546,686

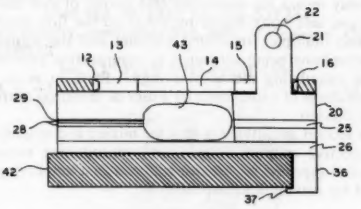
BAGEL SLICER

John J. Losiowski, and George J. Low, both of 300 Plum Space 91, Capitola, Calif. 95010

Filed Jul. 19, 1984, Ser. No. 632,594

Int. Cl.⁴ B26D *1/02*

U.S. Cl. 83—874 **3 Claims**



1. A hand operated slicing device comprising a top wall, two side walls and a bottom wall, the top wall having a feed opening for receiving a bagel into the device for slicing; and an elongate slot that is parallel to said side walls and intersects said feed opening; a pusher mechanism that is disposed within the space defined by the four walls, said pusher mechanism having a handle which extends through said slot; a stationary knife having a cutting edge parallel to the planes of the top and bottom walls, and a slide stop depending from said bottom wall for abutting a table edge said slide stop having an anti-lifting edge thereon that engages the underside of the table.

4,546,687

MUSICAL PERFORMANCE UNIT

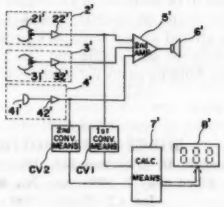
Eiji Minami, 23-2, Higashinakaburi 1-chome, Hirakata-shi, Osaka-fu, Japan

Filed Nov. 21, 1983, Ser. No. 555,004

Claims priority, application Japan, Nov. 26, 1982, 57-207814

Int. Cl.⁴ G10H *3/08, 3/09*

U.S. Cl. 84—1.28 **2 Claims**



1. A musical performance unit which employs a sound multiplex system recording medium including a first track on which a vocal signal is recorded and a second track on which a musical signal is recorded, said musical performance unit comprising:

a first reproducing means for reproducing the vocal signal on the first track of the sound multiplex system recording medium;

a second reproducing means for reproducing the musical signal on the second track of said sound multiplex system recording medium;

a first amplifying means for amplifying a signal from a microphone;

a first waveform converting means for producing a pulse signal

having a pulse width corresponding to a period of the output of said first reproducing means;

a second waveform converting means for producing a pulse signal having a pulse width corresponding to a period of the output of said first amplifying means;

a calculating means for calculating information and providing an output corresponding thereto based on relative variations in the outputs of said first waveform converting means and said second wareform converting means, said calculating means comparing pulse signal envelopes of said two pulse signals so as to determine the degree of coincidence therebetween during a predetermined time period;

a display means for displaying said output of said calculating means, said vocal signal recorded on the first track of the sound multiplex recording medium and the signal of the microphone being subjected to comparative processing by said calculating means in a digital form so as to display skillfulness of a song sung by a user or markings corresponding thereto;

and a second amplifying means for mixing and amplifying the respective outputs of said first reproducing means, said second reproducing means, and said first amplifying means and for driving a loudspeaker.

4,546,688

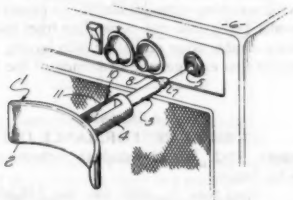
HOLDER FOR MUSICAL INSTRUMENTS

Anthony Cuccio, 156 S. Arnaz, Ojai, Calif. 93023

Filed Dec. 14, 1983, Ser. No. 561,541

Int. Cl.[4] G10G *5/00*

U.S. Cl. 84—327 **6 Claims**



1. A holder for a musical instrument comprising a cradle for receiving the neck of a musical instrument and a male jack prong adapted to be received in a standard female jack receptacle of the type found on electrical speaker/amplifier units, said cradle being affixed to said male jack prong, a gripping shank interposed between said cradle and said prong, and means in said shank for holding picks for a stringed musical instrument.

4,546,689

SHEET MUSIC HOLDER

Frank J. Morana, 18 Robertson Rd., West Orange, N.J. 07052

Filed May 2, 1983, Ser. No. 490,256

Int. Cl.[4] G10G *7/00*

U.S. Cl. 84—505 **17 Claims**

1. A sheet music holder for a book having a front and a back cover, a spine and individual pages comprising:

(a) a body member having a shaft member extending downwardly to a cross member;

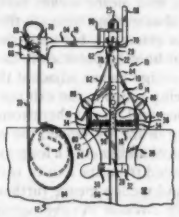
(b) clip means mounted on said body member and adapted to frictionally grasp the edge of a book;

(c) an arm member having a body portion rotatably mounted on the shaft member above the cross member, and an arm portion extending outwardly from said body portion;

(d) sheet retaining means vertically slidably mounted to and depending from the arm portion at a distance from the shaft;

(e) spring means comprising a pair of elongated resiliently bendable rods one end of each rod being anchored respectively to the cross member on opposite sides of the shaft and the other end of each rod anchored to the said body portion respectively on opposite sides of the shaft; and

(f) rotation stop means on the shaft extending generally



outwardly from the shaft, being generally perpendicular to the cross member, the rods alternately being engageable with the stop means as the arm member is rotated about the shaft member.

4,546,690

APPARATUS FOR DISPLAYING MUSICAL NOTES INDICATIVE OF PITCH AND TIME VALUE

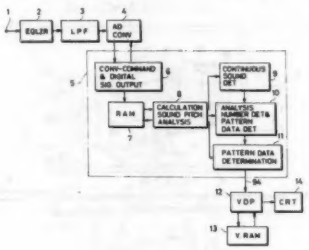
Yoshiaki Tanaka, Fujisawa; Mamoru Inami, Yokohama, and Zenju Otsuki, Kawasaki, all of Japan, assignors to Victor Company of Japan, Limited, Japan

Continuation-in-part of Ser. No. 567,175, Dec. 30, 1983, Pat. No. 4,510,840. This application Apr. 27, 1984, Ser. No. 605,672

Claims priority, application Japan, Apr. 27, 1983, 58-74331; Apr. 27, 1983, 58-74332; Apr. 27, 1983, 58-74333; Apr. 27, 1983, 58-74334

Int. Cl.[4] G09B *15/02;* **G04F** *5/02*

U.S. Cl. 84—477 R **20 Claims**



1. A musical note display device for displaying musical notes each indicative of pitch and time length of each sound of an input audio signal on a displayed staff, comprising:

(a) analog-to-digital converting means for converting said input audio signal into digital data by using sampling pulses having a sampling frequency;

(b) computing means for effecting FFT operation by using said digital data, for executing power spectrum calculation by using a result of sid FFT operation, for determining a pitch of each sound by using spectrum data obtained by said power spectrum calculation, for determining a time value of each sound by measuring time length of each sound, and for determining a pattern to be displayed in accordance with the pitch and time value of each sound;

said computing means determining the pitch by obtaining a fundamental tone by obtaining a frequency component whose level is lowest within a predetermined level range from a highest level, and whose frequency is lower than a frequency at which the level is the highest, and, in case such a frequency component is not detected, determining the pitch by regarding the frequency component, whose level is the highest, as the fundamental tone;

said computing means determining the time value by measuring time length for which each sound is regarded as continuous, where each sound is regarded as continuous when frequency difference and level difference between two consecutive detections are both within predetermind ranges, and when the level of said sound is above a predetermined level; and

(c) display means including a video display processor, a video RAM and a display unit, said video display processor being controlled by said computing means to store data indicative of said pattern into said video RAM, and said display unit being responsive to a video signal from said video display processor for indicating musical notes displayed at appropriate position on a display staff.

4,546,691

VACUUM POWER SERVO BOOSTER

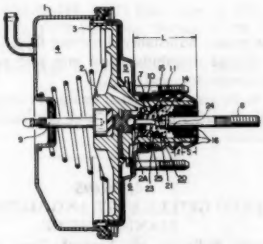
Michio Kobayashi, and Yasuo Tsuyuki, both of Saitama, Japan, assignors to Jidosha Kiki Company, Limited, Japan

Filed Nov. 10, 1981, Ser. No. 320,030

Claims priority, application Japan, Nov. 12, 1980, 55-161725[U]

Int. Cl.⁴ F15B 9/10

U.S. Cl. 91—376 R **2 Claims**



1. A control valve for a vacuum power servo booster for controlling communication between a constant pressure chamber and a variable pressure chamber of said booster, said booster having a piston coupled to a forward end of an input shaft and a generally cylindrically shaped valve housing extending rearwardly from said piston, said control valve comprising: a control valve body having a forward portion abutting a rear portion of said piston, a rearward portion forming an annular seat abutting a stepped portion of said valve housing, and a flexible skirt portion joining said forward and rearward portions; a retainer having a forward end extending into said rearward portion of said control valve body, said retainer having an annular portion within said rearward portion of said control valve body extending perpendicular to a longitudinal axis of said valve housing and a cylindrical wall portion coaxial with said longitudinal axis, having a larger diameter section extending rearwardly and a smaller diameter section extending forwardly of said annular portion, surrounding said annular portion, and forming forwardly of said annular portion and at the front portion of said retainer a recess sized and shaped to receive said skirt portion of said control valve body, said skirt portion being positively incorporated into said recess in the insertion of said control valve body into said valve housing, said recess being defined by an inner peripheral surface of said smaller diameter portion and a front surface of said annular portion; a first spring extending through an aperture in said annular portion of said retainer and abutting at opposite ends a rear surface of said forward portion of said control valve body and a first stop on said input shaft; and a second spring abutting at opposite ends a rear surface of said annular portion of said retainer and a second stop on said input shaft, an inner diameter of said forward portion of said cylindrical wall portion of said retainer being larger than an external diameter of said skirt portion of said control valve body where said skirt portion joins said forward portion of said control valve body, said annular portion and an adjacent portion thereto being arranged such that said skirt portion is receivable into said recess in a manner avoiding radially inward movement of said skirt toward said first spring.

4,546,692

RADIAL BEARING FOR DRIVE PLATE OF INCLINED-AXIS TYPE AXIAL PISTON MACHINE

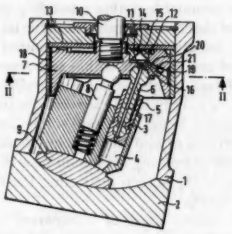
Manfred Lotter, Neu-Ulm, and Rainer Stölzer, Ulm, both of Fed. Rep. of Germany, assignors to Hydromatik GmbH, Elchingen, Fed. Rep. of Germany

Filed Sep. 30, 1983, Ser. No. 537,444

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1982, 3239175

Int. Cl.⁴ F01B 3/00; F01M 1/06

U.S. Cl. 92—12.2 **7 Claims**



1. An axial piston machine of the inclined axis type and operable as a pump or motor, said machine comprising:

a drive shaft which is operable as an input shaft for pump operation and as an output shaft for motor operation of the machine;

a drive plate rotatable with the drive shaft;

a machine housing in which the drive plate is rotatably mounted;

a drum having cylindrical bores and mounted in the housing with the axes of the cylindrical bores inclined to the axis of rotation of the drive plate;

pistons mounted for reciprocating movement in the cylindrical bores and connected to the drive plate;

and an axial slide bearing and a radial slide bearing arranged in the housing to provide axial and radial support for the drive plate;

wherein the radial slide bearing comprises:

a circumferentially spaced arrangement of pressure chambers corresponding in number to the number of pistons and formed in the outer periphery of the drive plate and each corresponding to a respective one of the cylindrical bores, said pressure chambers opening outwardly of the drive plate so as to form a hydrostatic and hydrodynamic radial slide bearing with an adjacent internal bearing surface of the housing, and each pressure chamber communicating with its respective cylindrical bore to receive therefrom a supply of operating medium of the machine and being angularly displaced relative to the cylindrical bore in such a way as to follow, or to precede, the cylindrical bore with respect to the direction of rotation of the drive plate in pump operation or motor operation, respectively;

wherein each pressure chamber is angularly displaced from its respective cylindrical bore and associated piston by about 90° with respect to the axis of rotation of the drive plate;

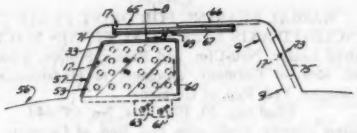
and means for fluid communicating each cylindrical bore with its respective pressure chamber comprising a through-passage formed in the associated piston and a respective passage in the drive plate communicating said through-passage with the pressure chamber.

4,546,693

VENT WINDOW ASSEMBLY

Johnnie McTaw, Jr., 17185 Bentler, Detroit, Mich. 48219

Filed Oct. 26, 1983, Ser. No. 545,467
Int. Cl.[4] F24F *7/00*
U.S. Cl. 98—2 **4 Claims**



1. A vent window assembly comprising a continuous channel frame mountable within a building or vehicle aperture;
- a pair of sheets of transparent material and a screen of small mesh snugly laminated and secured between said sheets, nested and retained within said frame;
- each of said sheets having a plurality of vertically spaced rows of longitudinally spaced apertures therethrough of a dimension larger than said screen apertures;
- the apertures of said sheets being in alignment respectively;
- the sheets permitting maximum flow of ventilating air therethrough, the screen restricting the flow of dust particles and insects;
- a vent closure sheet of transparent material slidably and adjustably mounted within said frame snugly engaging one of said sheets;
- said closure sheet having vertically spaced rows of longitudinally spaced apertures therethrough corresponding to and of the same size as said sheet apertures and in one position of said closure sheet in registry with said sheet apertures and in a second position of said closure sheet laterally displaced from said sheet apertures for adjustably closing selectively and blocking off flow of air through said laminate;
- and a handle projecting from said vent closure sheet for controlling sliding movements thereof within said frame to selectively and partly close and fully close off said laminate apertures.

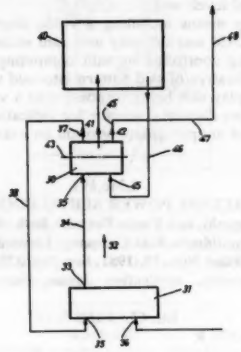
4,546,694

BLOWER UNIT FOR AIR-CONDITIONING PLANT

Wieland Heinz, Waldenburg, Fed. Rep. of Germany, assignor to Wilhelm Gebhardt GmbH, Fed. Rep. of Germany

Division of Ser. No. 442,272, Nov. 17, 1982, Pat. No. 4,493,341. This application Sep. 17, 1984, Ser. No. 651,056
Claims priority, application Fed. Rep. of Germany, Dec. 7, 1981, 3148357
Int. Cl.[4] F24F *13/04*
U.S. Cl. 98—34.6 **3 Claims**

2. An air conditioner system comprising a blower unit that includes:
- an outer housing defining a first and second chamber;
- said outer housing having a first and second inlet and a first and second outlet in communication with the respective first and second chambers;
- first and second blowers having impellers and being fixedly mounted in an axial direction in said respective first and second chambers;
- a distributor unit having a first and second inlet connected to respective first and second outlets of said outer housing, and having at least first and second outlet connectors;
- a gate means in said distributor unit for adjustably controlling flow to said first and second outlets;
- an air conditioner having two inlets and an outlet; said outlet of said air conditioner being connected to the first inlet of said outer housing;
- one of said inlets of said air conditioner being connected to said first outlet connector of said unit;
- the other of said inlets of said air conditioner being open to ambient air;
- said distributor unit having a third outlet connector;
- said gate means adjustably directing flow from said first inlet of said distributor unit into said first and third outlet connectors; and



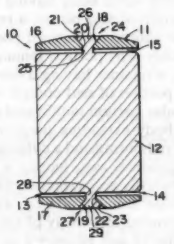
- said gate means adjustably directing flow from said second inlet of said distributor unit into said second and third outlet connector; and
- a room to be air conditioned being in communication with said third outlet connector and said second inlet of said distributor unit.

4,546,695

LOUVERED GRILLE UNIT AND METHOD OF ITS MANUFACTURE

Toshiki Ouchi, Fujisawa, and Yoshiaki Sano, Fuji, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama and Nihon Plast Company, Limited, Fuji, both of, Japan, part interest to each

Filed Sep. 21, 1982, Ser. No. 420,845
Claims priority, application Japan, Oct. 13, 1981, 56-161969
Int. Cl.[4] F24F *13/08*
U.S. Cl. 98—121.2 **11 Claims**



1. A grille unit for adjustably directing a fluid such as air, comprising:
- (a) a vane;
- (b) axially aligned first and second shafts of circular cross-section extending from the vane in opposite directions; and
- (c) a frame having axially aligned first and second holes of circular cross-section in which the first and second shafts rotatably fit respectively, whereby the vane can pivot about the shafts;
- (d) the diameter of at least part of the first shaft continuously varying along the axis thereof so that the first shaft has a varying-diameter surface;

(e) the frame having a first inner surface which defines at least part of the first hole and which conforms to and mates with the varying-diameter surface of the first shaft, the frame first inner surface slidably but frictionally engaging the varying-diameter surface of the first shaft;

(f) the diameter of at least part of the second shaft continuously varying along the axis thereof so that the second shaft has a varying-diameter surface, the varying-diameter surface of the second shaft facing in the direction opposite that of the varying-diameter surface of the first shaft;

(g) the frame having a second inner surface which defines at least part of the second hole and which conforms to and mates with the varying-diameter surface of the second shaft, the frame second shaft, the frame second inner surface slidably but frictionally engaging the varying-diameter surface of the second shaft;

wherein said frame is made of a first plastic, and said vane and said shaft are made of a second plastic, said first plastic having a melting point higher, and a shrinking rate smaller, than said second plastic.

4,546,696

WALL CONSTRUCTION FOR A VEHICLE CAB

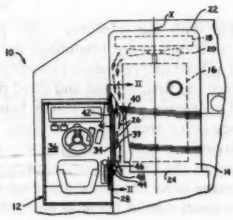
Jeffrey R. Fogg, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US82/00419, § 371 Date Apr. 5, 1982, § 102(e) Date Apr. 5, 1982, PCT Pub. No. WO83/03575, PCT Pub. Date Oct. 27, 1983

PCT Filed Apr. 5, 1982, Ser. No. 638,446

Int. Cl.[4] B06H *1/24*

U.S. Cl. 98—2.18 **8 Claims**



1. A wall interposed between a heated compartment having a flow of air therethrough and an adjacent relatively cooler compartment comprising:

a first panel exposed to said cooler compartment having at least one opening therethrough;

a second panel exposed to said heated compartment adjacent the flow of air and being positioned in spaced relation to said first panel to form an air passage there between; and

means operatively associated with the second panel for creating a pressure drop sufficient for drawing air from within the cooler compartment through the opening in the first panel and through the air passage for cooling thereof in response to movement of the air flowing past the second panel.

4,546,697

DRIP COFFEEMAKER HOT WATER GENERATOR

Robert L. Schaeffer, Columbia Cross Roads, Pa., assignor to Black & Decker, Inc., Newark, Del.

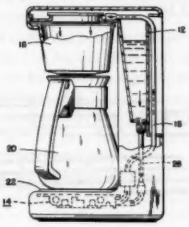
Filed Oct. 3, 1984, Ser. No. 657,349

Int. Cl.[4] A47J *31/00*

U.S. Cl. 99—279 **8 Claims**

1. In an electric drip coffeemaker wherein a ground coffee basket is positioned above a brewed coffee container and a hot water generator is provided for supplying hot water to the ground coffee basket and wherein the hot water generator includes a metal casting with an electric heating means positioned adjacent to a water channel with one end of the channel having an outlet for the discharge of hot water, the improvement comprising:

a. a plurality of transverse lands and grooves formed in the walls of said water channel so that the rates of thermal expansion and contraction of adjacent areas of the channel are non uniform to cause mineral deposits that build up on the lands and grooves and other surfaces of the water



channel to crack off or flake away in relatively small chips from differential thermal expansion and contraction, said lands and grooves being shaped to create turbulent water flow so that the mineral deposits will be flushed through the hot water generator to the ground coffee basket, said lands and grooves also being constructed to increase the surface area of the channel to enhance heat exchange efficiency that results in faster coffee brewing.

4,546,698

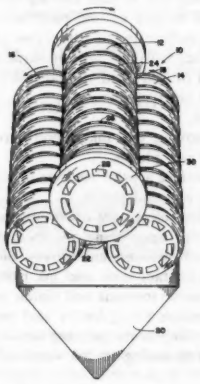
MILL ROLL WITH INCREASED JUICE FLOW CAPACITY

Jean Bouvet, 1319 Butterfield Rd., San Anselmo, Calif. 94960

Filed Sep. 9, 1983, Ser. No. 530,515

Int. Cl.[4] B21B *27/02*

U.S. Cl. 100—121 **8 Claims**



1. A mill roll for a liquid extracting system comprising:

a generally cylindrical, rigid body;

a plurality of circumferential grooves around the outer surface of said body;

a plurality of juice flow channels within and around said body below said outer surface thereof and opening from at least one end thereof;

said channels being of spiral configuration extending end to end of said body through less than one turn about the axis thereof; and

a plurality of generally radial holes in said body forming flow ducts between said grooves and said channels.

4,546,699

PRINTER HAVING DRIVE AND CONTROL SYSTEM FOR METAL BAND HOLDING PRINT ELEMENTS

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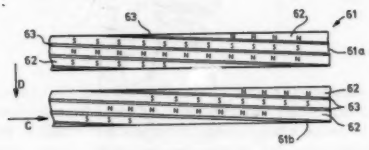
Filed Jun. 29, 1984, Ser. No. 626,517
Int. Cl.[4] B41J 1/20
U.S. Cl. 101—93.14 3 Claims



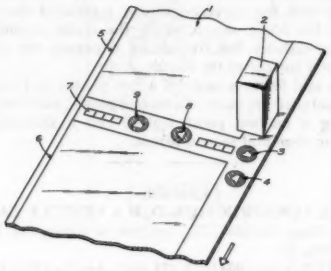
1. A printer comprising:
a platen,
a bank of hammers extending in a straight line along said platen and spaced from said platen,
a continuous metal band of magnetizable material,
a plurality of print elements attached to said band,
drive means for moving said band between said platen and said bank of hammers,
a guide surface extending along said hammer bank,
bearing means located adjacent to one edge of said guide surface and including at least one bearing surface extending perpendicular to said guide surface,
and a permanent magnet means located adjacent to said guide surface and to said bearing surface and adapted to attract one surface of said band into close contact with said guide surface and to attract one edge of said band into close contact with said bearing surface for controlling the movement of said band so that said print elements move along said line of hammers,
an ink ribbon,
means for moving said ink ribbon between said print elements and said platen,
means for feeding a print medium selectively between said ink ribbon and said platen,
and means for selectively operating said hammers so that each hammer, upon being operated, strikes a selected one of said print elements and moves said selected print element into contact with said ink ribbon causing said ink ribbon to move towards said platen and into contact with a print medium being fed by said print medium feeding means resulting in the printing on said print medium of a mark corresponding to the shape of said selected print element,
characterized by the improvement that
said permanent magnet means comprises
a plurality of elongated parallel sided permanent magnet members each magnetized so as to exhibit a pole of one polarity on one elongated surface and a pole of the opposite polarity on the opposite elongate surface,
said elongated permanent magnet members being positioned side by side in parallel lines with the exposed elongated surfaces of adjacent members exhibiting poles of opposite polarity,
and means for locating said permanent magnet members on said guide surface so that said parallel lines are inclined at an angle to the direction of movement of said band past said guide surface, towards said bearing surface.

4,546,700

METHOD AND APPARATUS FOR SENSING AND MAINTAINING COLOR REGISTRATION

Stanley J. Kishner, Pomona, and Ernest D. Park, Hopewell Junction, both of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Continuation of Ser. No. 335,764, Dec. 30, 1981, abandoned.
This application Jan. 3, 1984, Ser. No. 567,619
Int. Cl.[4] B41F 5/16, 13/12
U.S. Cl. 101—211 16 Claims



1. A method for sensing the color registration of a multicolor printing press having a printer for a reference color, a printer for a first process color, a printer for a second process color, and a printer for a third process color comprising the steps of:
(a) printing with the reference color printer at predetermined locations in the non-image areas of a sheet to be printed at least one reference register mark corresponding to each of the first, second and third process colors, each of said reference register marks being comprised of a reference color area and a clear area;
(b) overlaying each of the reference register marks corresponding to the first process color with a corresponding first process color register mark, each of said first process color register marks being comprised of a first process color area;
(c) measuring a single value of average reflectance for each overlay of said reference and first process color register marks, said single value of average reflectance being measured at a single point in time over the entirety of a first region comprised of a plurality of subregions formed as the result of said overlaying of said reference and first process color register marks, said subregions being comprised of a clear subregion having an area equal to the clear area of the reference register mark corresponding to the first process color overlay to the extent said clear area is not overlayed by said first process color area, a reference color subregion having an area equal to a portion of said reference color area within said first region to the extent said portion is not overlayed by said first process color area, a first process color subregion having an area equal to said clear area to the extent said clear area is overlayed by said first process color area, and an overlay subregion having an area equal to said portion of said reference color area within said first region to the extent said portion is overlayed by said first process color area, said average reflectance being a monotonic function of the registration of the first process color, each of said measured single values of average reflectance being an area-weighted sum of the reflectance of said subregions and representative of the registration of said first process color;
(d) overlaying each of the reference register marks corresponding to the second process color with a corresponding second process color register mark, each of said sec-

ond process color register marks being comprised of a second process color area;

(e) measuring a single value of average reflectance for each overlay of said reference and second process color register marks, said single value of average reflectance being measured at a single point in time over the entirety of a second region comprised of a plurality of subregions formed as the result of said overlaying of said reference and second process color register marks, said subregions being comprised of a clear subregion having an area equal to the clear area of the reference register mark corresponding to the second process color overlay to the extent said clear area is not overlayed by said second process color area, a reference color subregion having an area equal to a portion of said reference color area within said region to the extent said portion is not overlayed by said second process color area, a second process color subregion having an area equal to said clear area to the extent said clear area is overlayed by said second process color area, and an overlay subregion having an area equal to said portion of said reference color area within said region to the extent said portion is overlayed by said second process color area, said average reflectance being a monotonic function of the registration of the second process color printer, each of said measured single values of average reflectance being an area-weighted sum of the reflectance of said subregions and representative of the registration of said second process color;

(f) overlaying each of the reflectance register marks corresponding to the third process color with a corresponding third process color register mark, each of said third process color register marks being comprised of a third process color area;

(g) measuring a single value of average reflectance for each overlay of said reference and third process color register marks, said single value of average reflectance being measured at a single point in time over the entirety of a third region comprised of a plurality of subregions formed as the result of said overlaying of said reference and third process color register marks, said subregions being comprised of a clear subregion having an area equal to the clear area of the reference register mark corresponding to the third process color overlay to the extent said clear area is not overlayed by said third process color area, a reference color subregion having an area equal to a portion of said reference color area within said region to the extent said portion is not overlayed by said third process color area, a third process color subregion having an area equal to said clear area to the extent said clear area is overlayed by said third process color area, and an overlay subregion having an area equal to said portion of said reference color area within said region to the extent said portion is overlayed by said third process color area, said average reflectance being a monotonic function of the registration of the third process color, each of said measured single values of average reflectance being an area-weighted sum of the reflectance of said subregions and representative of the registration of said third process color;

(h) converting each of the measured single values of average reflectance representative of the registration of the first, second and third process color printers to a first, second and third registration error signal, respectively, using a predefined equation;

(i) inputting the first, second and third registration error signals into a closed-loop control system operatively connected to a printing press cylinder registration mechanism of each of the first, second and third process colors to adjust each of said mechanisms, and thereby automatically maintain the registration of the first, second and third process colors;

(j) printing at predetermined locations in the non-image areas of the sheet at least one solid patch for each of the reference, first, second and third process colors;

(k) measuring the reflectance of each of said solid patches, and thereby, of said reference, first, second and third process colors;

(l) compensating for variations in the reflectance of said reference, first, second and third process colors in converting said single values of average reflectance into said first, second and third registration error signals;

(m) printing at predetermined locations in the nonimage areas of the sheet for each of the reference and first, second and third process colors;

(1) at least one first color bar pattern comprised of a plurality of linear bars parallel to the direction of motion of the paper, each of said bars having a width equal to the spacing between said bars, and

(2) at least one second color bar pattern comprised of a plurality of linear bars perpendicular to the direction of motion of the paper, each of said bars having a width equal to the spacing between said bars,

(n) measuring the reflectance of each of said first and second color bar patterns, said reflectance of said first color bar pattern being representative of fill-in, said reflectance of said second color bar pattern being representative of slur; and

(o) compensating for variations in said reflectances, and thereby, said fill-in and slur in said reference, first, second and third process colors in converting said single values of average reflectance into said first, second and third registration error signals.

4,546,701

INKING UNIT FOR PRINTING PRESSES

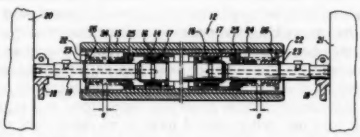
Rudi Junghans, Wilhelmsfeld, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Oct. 18, 1984, Ser. No. 662,241

Claims priority, application Fed. Rep. of Germany, Oct. 19, 1983, 8330123[U]

Int. Cl.[4] **B41F** *31/14;* **B41L** *27/16*

U.S. Cl. 101—349 **2 Claims**



1. An inking unit for printing machines wherein ink is fed in a metered fashion from an ink supply tank to inking rollers of the inking unit by which an ink film is applicable to a printing plate via a plurality of ink form rollers respectively in contact with a distributor roller and disengageable from a plate cylinder, the last of the plurality of form rollers, as viewed in rotational direction of the plate cylinder, being constructed so as to oscillate, comprising a roller shaft mounted so as to be fixed against rotation in bearings on the printing machine, the oscillating form roller having a casing with an outer cylindrical surface, said form roller casing being rotatably mounted on said roller shaft and being axially displaceable on said roller shaft for performing a stroke limited at both sides by respective pairs of bushings also mounted on said roller shaft, and including a respective compression spring disposed between the bushings of the respective pairs of bushings on each side of said oscillating form roller.

4,546,702

APPARATUS FOR HOLDING PRINTING PLATES ON THE CYLINDER OF A PRINTING PRESS

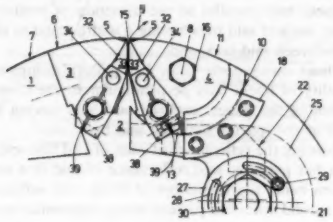
Joachim Dorow, Frankenthal, Fed. Rep. of Germany, assignor to Albert-Frankenthal AG, Fed. Rep. of Germany

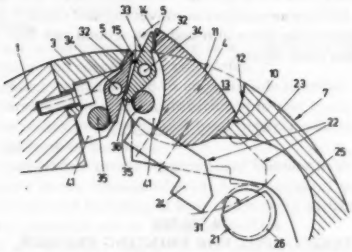
Filed Mar. 30, 1984, Ser. No. 595,107

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1983, 3315488

Int. Cl.[4] B41F 27/12

U.S. Cl. 101—415.1 9 Claims





1. In an apparatus for fixing a printing plate on a plate cylinder body at two sides of a well running generally continuously in the axial direction of the plate cylinder body, said plate cylinder body being supported for turning about a cylinder axis, comprising:

two clamping members adapted to take effect on two separate hook-like bent ends on the printing plate, said clamping members being placed on said two sides of said well;

pivot means rockingly supporting at least one of said clamping members for rocking motion thereof about an axis that is parallel to the cylinder axis, said rockingly supported clamping member taking the form of a segment bar having a cross-section that is generally three-sided and segment-like, said bar being placed next to an outer face of said cylinder body, and having an outer face lined up with and continuing said outer face of said cylinder body, said segment bar further having a convex, part-cylindrical base face at a limit of said outer face of said bar, said convex base face fitting into a socket therefor in said cylinder body, said socket being part-cylindrical and concave with a curvature in keeping with the form of the said convex face, and adjoining said outer face of said body;

separate gripping parts each adapted for use with one of the clamping members, said gripping parts are in the form of rails running along said well, each rail having a radial cross-section in the form of a radially outer arm and a radially inner arm joined together at a rocking axis defined by said rail, each said rail being rockingly supported on a different one of said clamping members for rocking about said axis;

two pivot shafts on which said rails are supported for rocking motion;

two excentric shafts each for acting on one of said gripping parts and causing same to grip one of the hook-like ends of the printing plate, each said eccentric shaft having an end structure adapted to be turned by a tool; and

locking bars for acting on ends of said eccentric shafts for locking same in a given position of turning, said locking bars having holes therein taking up ends of said pivot shafts on which said rails are supported, wherein:

one of said rails has a head facing the other said clamping member which is designed to run against the radially inner arm thereof on rocking of said segment bar in a plate releasing direction;

said clamping members are formed with stages spaced out along the well of said cylinder, said stages running into said well from the sides thereof, said pivot and cam shafts for operation of said gripping parts being supported on said stages;

the rails and the segment bar are divided up into a number of lengths, equal to the breadth of such plate, placed end to end along the length of the cylinder; and

each part of the divided segment bar has its own such cam shaft, such own cam shafts being plugged into each other.

4,546,703

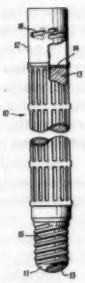
CHARGE PLACEMENT DEVICE

Farish R. Thompson, Rte. 1, Afton, Wyo. 83110

Filed Nov. 2, 1983, Ser. No. 547,847

Int. Cl.[4] F42B 3/00

U.S. Cl. 102—333 10 Claims



1. A device for placing an explosive charge into a bore hole, said explosive charge made up of a plurality of explosive filled modules, each module having a threaded male coupling portion at one end and a threaded female coupling portion at the other end, said device comprising:

a plug fitting having one end adapted for fixed connection to the end of a tamping pole, the other end of said plug fitting having external threads formed thereon, said fitting being sized to be rotatably attachable by insertion within the female end of the uppermost module of said explosive charge, said external threads formed with sufficient tolerance relative to internal threads of said female module end to ensure that the torque required for disconnection of said plug from said module end is substantially less than the torque required to separate one module from another.

4,546,704

TRAINING CARTRIDGE WITH PLASTIC PROJECTILE OR DUMMY PROJECTILE

Kurt Ballreich, Nuremberg; Ernst Jensen, and Jürgen Knappworst, both of Fürth , all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Oct. 17, 1983, Ser. No. 542,441

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1982, 3238269

Int. Cl.⁴ F42B *5/22*

U.S. Cl. 102—444 **7 Claims**

1. A training cartridge equipped with a synthetic resin projectile comprising a cylindrical metal cartridge case which is open at both ends, a synthetic resin projectile integrally molded onto a synthetic resin sleeve and a separate metal closure member; said synthetic resin sleeve being open at its rear end and being inserted into the cartridge case through one end thereof; said cartridge case having a preformed case shoulder and case neck at the other end; said synthetic resin sleeve being in close contact with said case shoulder, said case neck and an inner wall of the cartridge case and being held therein by means of the separate metal closure member inserted in the other end of the cartridge case and firmly joined to the cartridge case; said synthetic resin sleeve being integrally molded the projectile at a rear end of the projectile; the cartridge case being extended up to the rear end of said projectile; and the case neck, which is at an open end of the cartridge case, being flush with the rear end of the projectile whereby clean separation of the projectile from the sleeve is achieved upon firing of the training cartridge.

4,546,705

BLANK FOR A SABOT AND PROCESS FOR MAKING THE SAME

Rolf Langenohl, Viersen, and Heinz Mestekemper, Ratingen, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

PCT No. PCT/DE82/00134, § 371 Date Feb. 4, 1983, § 102(e) Date Feb. 4, 1983, PCT Pub. No. WO83/00214, PCT Pub. Date Jan. 20, 1983

PCT Filed Jun. 25, 1982, Ser. No. 463,836

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1981, 3125129

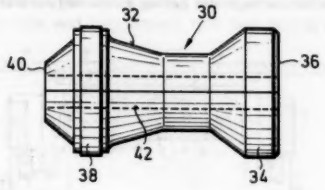
Int. Cl.⁴ F42B *13/16*

U.S. Cl. 102—520 **6 Claims**

1. An improved process for producing a blank for a rotation-symmetrical sabot arranged around a sub-caliber projectile in a region between the nose and tail thereof and having at least two segments, which extend along radial separating lines over the entire sabot length, wherein the improvement comprises the steps of:

(a) non-cuttingly shaping over the entire length of the blank a substantially circular cross-sectional shape, and introducing radial cuts having substantially wedge-shaped cross-sections, the number of radial cuts corresponds to the number of separating lines of the sabot, so that a semi-finished product in a first process step is formed;

(b) closing the wedge-shaped cuts, so that mutually adjacent surface regions of the cuts are in contact with one another at separating lines, and so that a semi-finished product of a second process step is obtained by means of which the semi-finished product is reduced to a predetermined excess dimension; and



(c) dividing the semi-finished product transversely to the longitudinal axis into predetermined lengths of a blank, corresponding to the sabot.

4,546,706

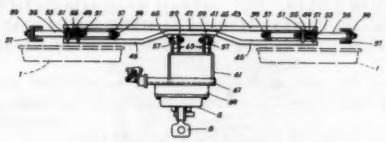
EQUIPMENT MOUNTING STRUCTURE FOR INSIDE BEARING RAILWAY CAR TRUCKS

Keith L. Jackson, Creve Coeur; Eugene L. Benner, Des Peres; Richard B. Polley, St. Charles, all of Mo., and James J. Wickman, Granite City, Ill., assignors to Lukens General Industries, Inc., Coatesville, Pa.

Filed Nov. 18, 1983, Ser. No. 552,925

Int. Cl.⁴ B60L *5/39;* **B61F** *15/00*

U.S. Cl. 105—182 E **19 Claims**



1. In a railway vehicle truck, a pair of wheel and axle assemblies, journal boxes supported on the end portions of said assemblies, a rigid truck frame having side members with pairs of depending legs spaced apart longitudinally of the truck forming downwardly open pedestal jaws vertically movably receiving said journal boxes, resilient elements supporting said frame directly from said journal boxes, beam means elongated longitudinally of the truck for stably supporting equipment at a constant height above the track rails, structure suspending said beam means at their ends from the journal boxes at the respective sides of the truck, and pedestal tie means extending across said pedestal jaws and connecting the lower extremities of said pedestal legs, one of said means at each side of the truck being bifurcated whereby to avoid interference between said beam means and said pedestal tie means and thereby to accommodate suspension of said beam means from said journal boxes.

4,546,707

RAIL-MOUNTED CONVEYANCE

Horst Siffrin, Merchweiler, Fed. Rep. of Germany, assignor to Walter Becker GmbH, Friedrichsthol, Fed. Rep. of Germany

Filed May 13, 1983, Ser. No. 494,184

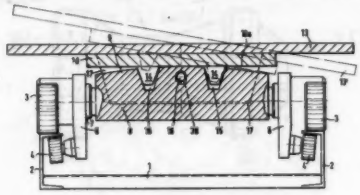
Claims priority, application Fed. Rep. of Germany, May 29, 1982, 3220484

Int. Cl.⁴ B61F *5/00;* **B61D** *11/00*

U.S. Cl. 105—199 R **20 Claims**

1. A rail-mounted conveyance, particularly for use in underground excavations, comprising an undercarriage; a superstructure; and means for articulately connecting said super-

structure to said undercarriage with freedom of movement about three axes including a first axis extending in the direction of travel of the conveyance, a second axis extending transversely of the direction of travel of the conveyance, and a third axis at least substantially normal to said first and second axes, said connecting means comprising a first member forming part of said undercarriage and having a first surface and a second



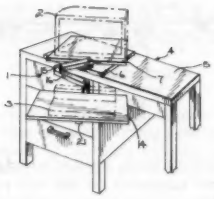
member forming part of said superstructure and having a second surface in substantially linear contact with said first surface, the line of contact between said surfaces defining said first axis and one of said surfaces being convex so that the other of said surfaces can perform a rolling movement therealong or vice versa with attendant sidewise shifting of said first axis in the direction of said second axis.

4,546,708

DESK TOP ORGANIZER

Daniel N. Wilburth, 3757 W. Grange, Greenfield, Wis. 53221

Filed Aug. 1, 1983, Ser. No. 519,262
Int. Cl.[4] A47B *21/03*
U.S. Cl. 108—94 **1 Claim**



1. A support for supporting components such as a cathode ray tube display screen and keyboard of a computer terminal and the like at a work station, comprising:

a base mounted on a horizontal surface at the work station;

a turntable rotatably mounted on said base for supporting one of said components thereon;

first bearing means for rotatably mounting said turntable on said base, said first bearing means includes an upper annular plate adjacent said turntable and a lower annular plate adjacent said base;

support means for reinforcing the mounting of said turntable on said first bearing means, said support means includes a central bracket plate positioned between said upper bearing plate and said turntable that extends radially with respect to said upper bearing plate so that one end projects from an edge of said turntable and a pair of side bracket plates located parallel to and on opposite sides of said central bracket plate between said upper bearing plate and said turntable;

a platform for supporting another of said components thereon;

connecting means for interconnecting said platform and turntable for providing relative movement of said platform toward and away from as well as laterally with respect to said turntable, said connecting means includes a first arm pivotally mounted at one end to said projecting one end of said central bracket plate, and a second arm pivotally mounted at one end to the other end of said first arm,

second bearing means for rotatably mounting said platform on the other end of said second arm, said second bearing means includes a third arm supporting said platform and pivotally mounted at one end to the other end of said second arm;

stop means for supporting said turntable in fixed relationship to said base when said turntable is rotated to any one of a plurality of desired work positions, said stop means is located at the pivotal connection of said first arm to said turntable and includes an annular stop member positioned beneath said projecting one end of said central bracket plate having a planar surface frictionally slidably engageable with a corresponding planar surface on said base, and

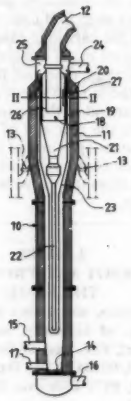
the pivotal connection of said first arm to said central bracket plate includes a pin extending through said first arm and central bracket plate into said annular stop member.

4,546,709

APPARATUS FOR THE COMBUSTION OF CARBONACEOUS MATERIAL

Ingemar Åström, Stenungsund, Sweden, assignor to Gotaverken Energy Systems AB, Göthenburg, Sweden

Filed Jul. 10, 1984, Ser. No. 629,460
Claims priority, application Sweden, Jul. 15, 1983, 8303992
Int. Cl.[4] F23J *3/00*
U.S. Cl. 110—216 **9 Claims**



1. An apparatus for the combustion of carbonaceous material in a vertical reaction chamber having air supply means for maintaining a fluidized bed in its lower part and to maintain combustion, comprising;

a cyclone separator above said bed to receive combustion gases therefrom and to remove solid matter from the gases;

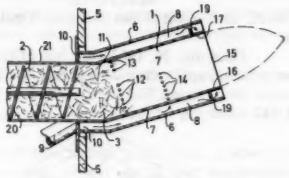
an elongated flow pipe connected to said cyclone separator and extending towards the fluidized bed for returning solid matter to said bed; and

a sleeve enclosing said cyclone separator and extending downwardly about said pipe to approximately the mouth of the pipe and terminating in an ejector means, said sleeve being connected to said air supply means for conducting part of the combustion air from a source thereof.

4,546,710
BURNER HEAD

Jens Cremer, Kalmar, Sweden, assignor to Euronom AB, Kalmar, Sweden

PCT No. PCT/SE82/00332, § 371 Date Jun. 14, 1983, § 102(e) Date Jun. 14, 1983, PCT Pub. No. WO83/01497, PCT Pub. Date Apr. 28, 1983
PCT Filed Oct. 13, 1982, Ser. No. 509,449
Claims priority, application Sweden, Oct. 20, 1981, 8106197
Int. Cl.[4] F23G *7/00;* F24D *1/02*
U.S. Cl. 110—263 3 Claims



1. A burner head for combusting solid fuels such as straw, peat, chips, coal etc., comprising a charging opening (**11**) for the fuel and a discharge opening (**15**) for flue gases, where the burner head (**1**) comprises two tubes (**6,7**) located concentrically to each other, where the inner tube (**7**) forms a charging opening (**11**) for the fuel and a discharge opening (**15**) for flue gases, and where the gap (**8**) between the tubes is intended to communicate with a supply source (**9,10,18**) for combustion air and communicates with the interior of the inner tube (**7**) via apertues (**12,13,14**) in the wall thereof, characterized in that the inner tube is made of metallic material, such as steel, the charging opening (**11**) and the discharge opening (**15**) formed by the inner tube (**7**) have substantially the same diameter as the diameter of the inner tube (**7**), said apertures comprise a first plurality of apertures (**12,13**) located a distance from the charging opening (**11**) to form a first combustion zone, at which the fuel is intended to be combusted incompletely, and a second plurality of apertures (**14**) spaced from said first mentioned apertures at a location, closer to the discharge opening (**15**), which is substantially centrally disposed between the charging opening (**11**) of the burner head (**1**) and the discharge opening (**15**) thereof, to form a second combustion zone, at which gases combusted incompletely from the first combustion zone are intended to be combusted completely, and screw conveyor means having an outlet matching and connected to the inlet of said inner tube adjacent said first plurality of apertures for introducing solid fuel into the charging opening and filling the inner tube with solid fuel at the charging opening.

4,546,711
APPARATUS AND METHOD FOR INCINERATING WASTE MATERIAL WITH A CONVERTED PREHEATER-TYPE LIME KILN

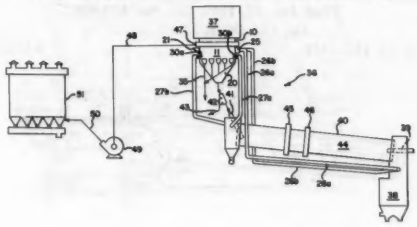
John M. Kerwin, Flossmoor, Ill., assignor to Marblehead Lime Company, Chicago, Ill.

Filed Oct. 24, 1983, Ser. No. 544,627
Int. Cl.[4] F23G *5/06*
U.S. Cl. 110—246 11 Claims

1. An apparatus for incinerating waste material comprising:

a rotary kiln; means for firing said kiln; means for preheating air for combustion; means for transferring said preheated air to said means for firing; means for preheating a processing agent; means for transferring said processing agent to said rotary kiln; means associated with said rotary kiln for introducing waste materials to a hot zone for said kiln; and means for removing incinerated material from said kiln;

said means for removing incinerated material comprising means for separating said incinerated material into a predominantly gaseous incinerated waste portion and a predominantly non-gaseous incinerated waste portion; means for removing said gaseous portion; and means for removing said non-gaseous portion; and wherein said means for preheating air comprise heat exchange tubing associated with said means for removing said gaseous portion, whereby incinerated waste gases having heat values are passed through said separating means associated with said rotary kiln and into contact with said tubing and said



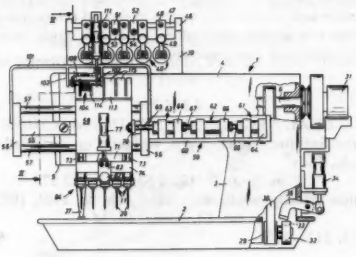
processing aid where said heat values are utilized to preheat both air for combustion and a processing aid;

and wherein said heat exchange tubing is substantially enclosed in a preheater housing, said preheater housing further comprising a processing aid storage bin; and said housing is further adapted to cooperate with said means for preheating a processing aid thereby enclosing said processing aid during preheating.

4,546,712
SEWING MACHINE HAVING THE NEEDLE HOLDER MAGAZINE WITH AUTOMATIC COUPLING AND DECOUPLING OF THREAD CONTAINING NEEDLES AND NEEDLE HOLDERS

Erich Willenbacher, Kaiserslautern, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Mar. 14, 1984, Ser. No. 589,493
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1983, 3309509
Int. Cl.[4] D05B *55/16;* D05C *11/06*
U.S. Cl. 112—89 16 Claims



1. A sewing machine equipped with a reciprocatable needle bar, a take-up lever engageable with the thread, and a thread changing mechanism, comprising a magazine, a plurality of needle holders received in said magazine, means mounting said magazine so that it is displaceable in the direction of its longitudinal axis and transversely to the reciprocation of the needle bar and vertically, said holders being separately and selectively couplable to the free end of said needle bar by a vertical relative motion between said magazine and the needle bar, said magazine having a plurality of sidewards open recesses for

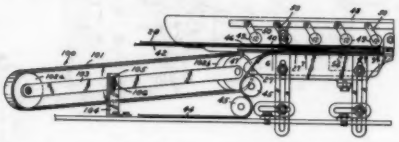
receiving respective ones of said needle holders and being movable in a horizontal plane crosswise to its longitudinal axis between the transfer position and a rest position, and also being movable vertically in order to effect the coupling and uncoupling operation.

4,546,713

HEM FOLDING MACHINE

Billy L. Speer, P.O. Box 416, Campbellsville, Ky. 42718

Filed Jan. 22, 1985, Ser. No. 692,909
Int. Cl.[4] D05B *33/02, 35/02*
U.S. Cl. 112—141 **6 Claims**



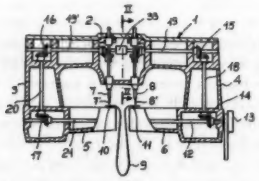
1. In a hemming machine having conveyor means to continuously convey successive pieces of cloth, progressive folding, tucking and sewing means adjacent said conveyor means adapted to fold and tuck within the fold an edge of each cloth piece preparatory to sewing, said folding and tucking means including spaced guide rails for maintaining a spaced relation between adjacent layers of the hem material, and supplemental tapered guide means extending between said spaced guide means for engaging, folding back and tucking the cloth edge between said adjacent layers, hem engaging conveying means supplemental to and synchronized for movement with the first mentioned conveyor for continuously drivingly engaging opposite outside surfaces of the hem portion of said cloth pieces during passage through said progressive, folding, tucking and sewing means, said hem engaging conveying means including means adjacent the outside surface of each of said guide rails and cooperating with said surface to feed each of said outside hem portion surfaces therebetween, a track plate provided for loading of said successive pieces of cloth with the hem material overhanging said conveyor and track plate on one side, said hem engaging means including an upper endless belt means to engage the upper layer of hem material adjacent said overhanging edge at the beginning of said progressive folding, tucking and sewing means characterized by the improvement of moving guide belt means extending from outside the path of said overhanging hem material angularly relative to and under said endless belt means in spaced relation adapted to intercept the leading edge of each passing cloth piece and to fold it under said conveyor and belt means.

4,546,714

DUAL NEEDLE BAR SEWING MACHINE

Roberto Sanvito, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Italy

Filed Aug. 23, 1984, Ser. No. 643,572
Claims priority, application Italy, Feb. 28, 1984, 19822 A/84
Int. Cl.[4] D05B *55/14*
U.S. Cl. 112—155 **6 Claims**



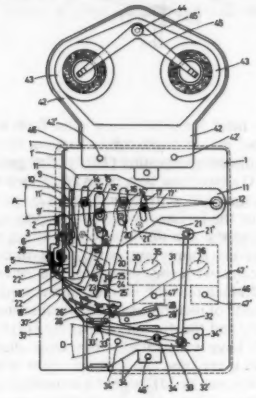
1. In a sewing machine the combination comprising: a pair of needle rods, mounted for reciprocal movement, a drive shaft operably connected to each of said needle rods and one of said shafts being operable connected to a drive source, and selectively operable clutch means connecting said drive shafts whereby only one of said shafts and its associated needle rod will be operated when desired or both shafts and their associated needle rods can be simultaneously operated when desired.

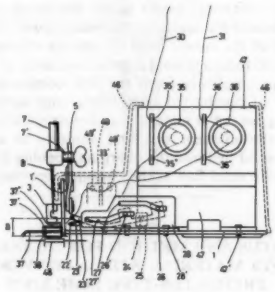
4,546,715

OVERCASTING ATTACHMENT FOR A SEWING MACHINE

Mikio Mori, 12-2, Chidori-cho 3-chome, Ogaki-shi, Gifu-ken, Japan

Filed Jul. 26, 1983, Ser. No. 517,284
Claims priority, application Japan, Aug. 5, 1982, 57-137033
Int. Cl.[4] D05B *1/20*
U.S. Cl. 112—162 **6 Claims**





1. An overcasting attachment for use with a two-threaded sewing machine having a needle bar provided with a needle, comprising:

a base plate having an end wall at a part of one lateral end thereof;

an L-shaped actuating lever pivoted intermediate the ends thereof to said end wall and having one end thereof slidably pivoted to said needle bar for substantially vertical swinging movement with said needle bar, the other end of said L-shaped actuating lever being movable transversely in a substantially horizontal plane;

a transverse-horizontal swing plate operatively connected at one end to the other end of said L-shaped actuating lever for transverse swinging movement in a substantially hori-

zontal plane, the other end of said transverse-horizontal swing plate being pivoted to said base plate at the opposite end remote from said end wall, said transverse-horizontal swing plate having a plurality of transversely deformed elongated slots;

at least a first and a second longitudinal swing member each having a first and a second end portion and each pivotally connected intermediate such end portions to said base plate and having at said first end thereof a shanked roller pin slidably engageable with the respective one of said deformed slots, said longitudinal swing members being movable longitudinally in a substantially horizontal plane in accordance with the respective contour of each said deformed slots; and

a first needle-like thread guide piece connected to said second end of said first one of said longitudinal swing members for guiding an individually prepared upper cross thread;

a second needle-like thread guide piece connected to the other end of said second one of said longitudinal swing members for guiding an individually prepared lower cross thread;

so that when said L-shaped actuating lever swings in accordance with the vertical reciprocating movement of said needle bar, the respective movements of said longitudinal swing members are applied sideways toward the needle at a suitable time during the vertical reciprocating movement of the needle in such a manner that said first and second needle-like thread guide pieces guide said individually prepared upper and lower cross threads, respectively, for engagement with the machine threads for straight stitching on the upper and lower surfaces of a cloth so as to form overcasting stitches.

4,546,716

DOUBLE OVERLOCK SEAMER

Edward Babson, Ipswich; Michael R. Porter, Topsfield, and Robert E. Porter, Hamilton, all of Mass., assignors to Porter Sewing Machines, Inc., Beverly, Mass.

Filed Jul. 30, 1984, Ser. No. 635,714
Int. Cl.[4] D05B *1/08, 1/20*
U.S. Cl. 112—162 **24 Claims**

1. A sewing machine of the type for producing three distinct lines of stitching in two superposed top and bottom plies in a single sewing operation in which the top ply and bottom ply edges are separately stitched, comprising

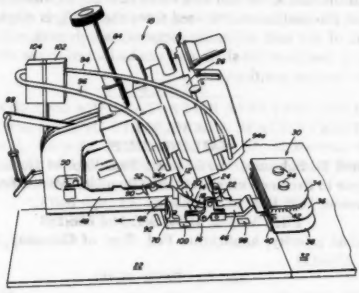
a base drive mechanism having three spaced juxtaposed, stitch forming means, two of which are in substantial alignment in a stitching area,

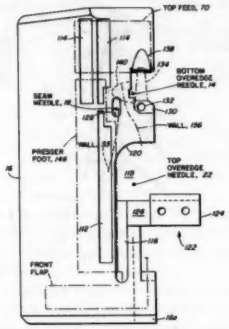
a throat plate assembly mounted in said stitching area including a base plate having a plurality of feed dog slots,

lower feed dog means connected to said drive mechanism for engaging and disengaging the lower surface of the bottom ply through said slots to advance the work through said stitching area,

separate presser foot means for urging both plies against said base plate into contact with said lower feed dog means,

said throat plate assembly further including means connected to said base plate for diverting one ply while the edge of the other ply is stitched by a corresponding one of said stitch forming means and for diverting the stitched edge of said other ply while the edge of said one ply is stitched by the other one of said aligned stitch forming means, the third one of said stitch forming means being positioned to unite said plies along a seam,





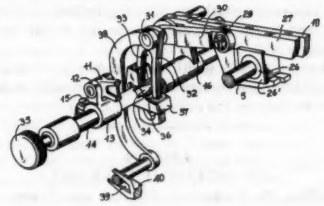
whereby said presser foot means is substantially free of active ply diverting elements thus increasing the visibility of the stitching area.

4,546,717

SEWING MACHINE DIFFERENTIAL FEED

Franco Marchesi, Pavia, Italy, assignor to Rockwell-Rimoldi S.p.A., Italy

Filed Aug. 23, 1984, Ser. No. 643,573
Claims priority, application Italy, Feb. 28, 1984, 19824 A/84
Int. Cl.[4] D05B *27/08*
U.S. Cl. 112—313 **4 Claims**



1. Device for feeding the work in a differential-feed sewing machine, comprising a feed shaft oscillating about its axis, a curved lever connected on the one side to the said shaft and on the other side to a small connecting rod which is in turn hinged with the differential feed slide and an element for adjusting the feed in order to vary the amplitude of oscillation of the said small connecting rod, wherein there are provided means for

locking and releasing the said lever with respect to the feed shaft and wherein the element for adjusting the feed is free at one end and at the other end is articulated with a pin with which the said lever and said small connecting rod are hinged so that the said lever, released from the shaft, is displaced by means of the said adjusting element, which makes it project more or less from the shaft, and can be locked to the shaft itself in the various positions.

4,546,718

SAILING SHIP

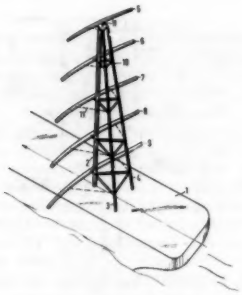
Hartmut B. Schwarz, Norderstedt, Fed. Rep. of Germany, assignor to Bremer Vulkan AG Schiffbau Und Maschinenfabrik, Bremen, Fed. Rep. of Germany

Filed May 2, 1984, Ser. No. 606,288

Claims priority, application Fed. Rep. of Germany, May 3, 1983, 3316139

Int. Cl.⁴ B63B *35/00*

U.S. Cl. 114—39 **15 Claims**



1. A sailing ship (1) having at least one tripod-like mast rigidly attached thereto, said mast comprising interconnected struts (2, 3, 4), two of which straddle the longitudinal axis of the ship with the third strut arranged between and in front of the two straddling struts;

curved yards (5–9) pivotally attached to said mast;

bracing means (11–20) cooperatively interconnecting the yards attached to said mast for controlling the pivotal movement of the yards;

an actuating shaft (21) arranged at the mid-section of the yards (5–9) and extending between adjacent yards for reefing a sail (22) spread between those yards;

sail erection means attached to the sail on opposed sides at the upper and lower corners of the sail and extending generally in the direction of the longitudinal extension of the yards, said yards having longitudinal grooves (27);

upper and lower boltrope means for a sail held in the grooves; and

a sail having a lesser width in the central portion than at the top and bottom thereof and a lesser height in the central portion than on the edges thereof.

4,546,719

ARRANGEMENT IN VESSELS

Geoff Collins, St. Catharines, Canada, and Kimmo Juurmaa, Vantaa, Finland, assignors to Oy Wartsila Ab, Helsinki, Finland

Continuation of Ser. No. 322,935, Nov. 19, 1981, abandoned. This application Feb. 6, 1984, Ser. No. 577,303

Claims priority, application Canada, Feb. 10, 1981, 370510

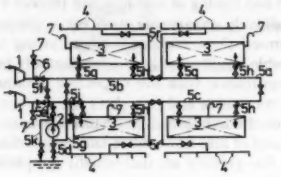
Int. Cl.⁴ B63B *1/38, 35/08*

U.S. Cl. 114—40 **20 Claims**

11. In a vessel adapted for moving in ice filled waters, said vessel having a hull with underwater openings, a dual purpose air bubbling system and a ballast system having a plurality of ballast tanks; said vessel including:

a common tube system associated with each and alternatively connectable with said air bubbling system and said ballast system;

said dual purpose air bubbling system including means for blowing air through said openings into the water surrounding the vessel after first being conveyed thereto



through said common tube system and for blowing compressed air to said ballast tanks to prevent ambient water from penetrating thereinto after being conveyed to said ballast tanks through said common tube system; and

said ballast system including means for feeding fluid into said tanks and means for expelling fluid from said tanks through said common tube system by means of pumping water.

4,546,720

CONNECTING DEVICE BETWEEN THE WISHBONE AND THE MAST OF A SAILBOARD

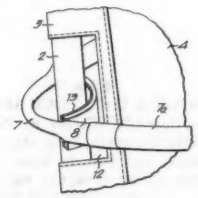
Thierry M. Dumortier, Hermee, Belgium, assignor to Fabrique Nationale Herstal, Herstal, Belgium

Filed Aug. 31, 1983, Ser. No. 528,177

Claims priority, application Belgium, Sep. 6, 1982, 2/59818

Int. Cl.⁴ B63B *15/00*

U.S. Cl. 114—98 **3 Claims**



1. A connecting device for connecting a wishbone having two arms with the mast of a sailboard or the like, and having a pair of side booms connected to the wishbone, comprising: a substantially V-shaped element pivotally connected by means of a pivotal connection to each arm of the wishbone and arranged to engage the mast when hoisting home the clew of the sail on the wishbone; said pivotal connection including each of the arms of the wishbone having a block with a slot therein, and the V-shaped element having projection means thereon engaging the slots, whereby the side booms and wishbone are pivotable in a vertical direction relative to the V-shaped element.

4,546,721

SUBMERGED SINGLE POINT MOORING SYSTEM

Donald G. Langrock, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 5, 1983, Ser. No. 491,684

Int. Cl.⁴ B63B *21/00*

U.S. Cl. 114—230 **8 Claims**

1. A submerged single point mooring system for sea going

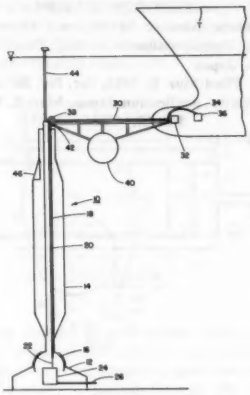
ships, such as storage or production tanker vessels, particularly for use in arctic waters, comprising:

(a) a base affixed to the sea bed;

(b) a bouyant vertical column extending from said base to a level below the surface of said waters;

(c) a spherical bearing interconnecting said base and the lower end of said vertical column to facilitate articulation and rotation of said vertical column relative to said base;

(d) a boom extending from the upper end of said vertical



column, said boom being entirely submerged beneath the surface of said water;

(e) universal joint means interconnecting the upper end of said vertical column and the adjoining end of said boom;

(f) and a telescoping column extension normally retracted into the upper end of said vertical column, said column extension being upwardly extendable so as to project above the surface of said waters to allow for diverless access to the interior of said column for the inspection and servicing of said column.

4,546,722

DEVELOPING APPARATUS FOR ELECTROPHOTOGRAPHIC COPYING MACHINES

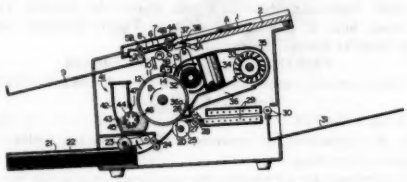
Akitoshi Toda, and Yoshiyuki Mimura, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1984, Ser. No. 677,844

Claims priority, application Japan, Dec. 1, 1983, 58-228059; Dec. 1, 1983, 58-228060

Int. Cl.[4] G03G *15/09*

U.S. Cl. 118—657 **20 Claims**



1. A developing apparatus for an electrophotographic copying machine comprising:

conveyor means for conveying a developer from a developer vessel to a location adjacent to an electrostatic latent image carrying member;

a developer carrier disposed in opposing relationship with and at a given spacing from the latent image carrying member;

a vibrator mounted on the carrier and formed by a piezoelectric element having a pair of electrodes; and

drive means for applying an alternating voltage across the electrodes of the vibrator to cause the latter to oscillate, thereby urging the developer on the carrier to fly toward the latent image carrying member.

4,546,723

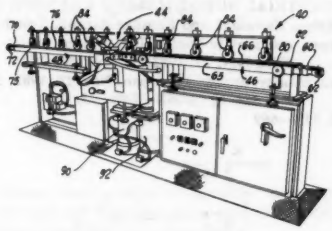
METHOD AND APPARATUS FOR APPLYING SEALANT TO INSULATING GLASS PANEL SPACER FRAMES

Edmund A. Leopold, Hudson, and Glen D. McKeown, Rootstown, both of Ohio, assignors to Glass Equipment Development, Inc., Twinsburg, Ohio

Filed Apr. 19, 1984, Ser. No. 602,195

Int. Cl.[4] B05C *5/02;* **B05D** *5/10*

U.S. Cl. 118—669 **22 Claims**



1. A system for applying sealant to partially assembled spacer frames formed by a plurality of spacer frame segments having opposed free ends and adjacent ends connected at their junctures comprising:

(a) a sealant applying station defined by first and second sealant extrusion nozzles positioned for applying sealant to opposite sides of spacer frame segments and a third sealant extrusion nozzle positioned for applying sealant to a spacer frame side between said opposite sides;

(b) spacer frame advancing means for feeding a plurality of spacer frame segments along a path of travel to said station in substantial longitudinal alignment;

(c) extrusion nozzle control means for rendering said nozzles operative to apply sealant to said spacer frame segments passing through said sealant applying station in response to control signals;

(d) spacer frame detection means for producing signals indicating the presence of the spacer frame at said station; and,

(e) signal processing means coupled to said detection means and to said nozzle control means for producing control signals for intermittently operating said third extrusion nozzle in response to the presence of the leading end of the spacer frame segments at said station, and the approach of the junctures of subsequent spacer frame segment ends and the trailing frame end, said third nozzle operated intermittently to apply sealant to said ends and the spacer frame junctures.

5. A method of constructing spacer frames comprising:

(a) connecting ends of spacer frame segments to form a longitudinally aligned succession of frame segments connected at adjacent ends;

(b) providing a sealant application station having a sealant extrusion nozzle for directing sealant onto one side of the spacer frame segments;

(c) feeding the spacer frame segments to the sealant applying station;

(d) detecting the leading end of the assembled spacer frame segments approaching the station and producing a detection signal and a timing signal;

(e) initiating and terminating operation of said nozzle in response to said signals to extrude sealant onto a short

section of the frame side segment adjacent said leading end;

(f) detecting successive junctures of the frame segments approaching the station and producing juncture detection signals and timing signals;

(g) initiating and terminating operation of said nozzle in response to detection of successive frame segment junctures approaching said station to extrude sealant onto the frame segment sides adjacent the junctures with the sealant bridging the junctures;

(h) detecting the trailing end of the frame segments approaching the station and producing a detection signal and timing signal;

(i) initiating and terminating operation of the nozzle in response to the signals to apply a short section of sealant along the trailing end of the frame segment.

4,546,724

INDUSTRIAL ROBOT HAVING A SENSOR UNIT

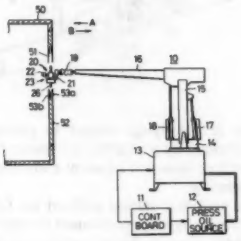
Kyuji Kiryu, Kawasaki, and Kensuke Aizawa, Yokohama, both of Japan, assignors to Tokico, Ltd., Japan

Filed Nov. 17, 1983, Ser. No. 552,722

Claims priority, application Japan, Nov. 19, 1982, 57-203282

Int. Cl.⁴ B05B *13/06, 15/10*

U.S. Cl. 118—669 **8 Claims**



1. An industrial robot comprising an arm, a driving source for driving said arm, an operation unit provided at a tip end of said arm, said operation unit comprising a nozzle unit which sprays paint in the form of paint mist and carries out a painting operation, a sensor unit provided at the tip of said arm, in a vicinity of said operation unit, and engaging means provided at the tip end of said arm,

said sensor unit comprising a sensor of a non-contact type for detecting a workpiece which is to be subjected to an operation carried out by said operation unit, said workpiece having a door which is provided with a groove defined by a pair of window frames, a shutter plate which undergoes displacement between a first position opposing a front of said sensor and a second position deviated from said front of said sensor for preventing said paint mist from entering said front of said sensor when said shutter plate assumes said first position, means for causing said shutter plate to displace from said first position at least while said sensor carries out a detecting operation to detect said workpiece, and for causing said shutter to assume said first position at least while said operation unit carries out said operation, a case for accommodating at least said front of said sensor and said shutter plate, said case being provided with an air chamber and an opening which opposes said front of said sensor, said shutter plate in said first position being located between said front of said sensor and said opening, said air chamber communicating to said opening through a region which includes said front of said sensor and the vicinity thereof, and air purge means for ejecting air in said region, said air purge means comprising means for supplying air to said air chamber,

said sensor detecting one of said window frames of said workpiece and the other of said window frames while said tip end of said air is forwardly driven, said tip end of said arm being backwardly driven by a predetermined distance in response to the detection of said two window frames so that said engaging means engages with said groove, said engaging means moving said door after engaging said groove.

4,546,725

APPARATUS FOR MANUFACTURING MAGNETIC RECORDING MEDIA

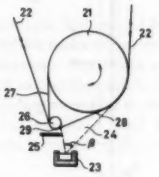
Ryuji Shirahata; Masaru Sekine, and Goro Akashi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 8, 1984, Ser. No. 587,421

Claims priority, application Japan, Mar. 8, 1983, 58-37906

Int. Cl.⁴ C23C *13/10*

U.S. Cl. 118—718 **5 Claims**



1. A magnetic recording medium manufacturing apparatus for depositing a material onto a medium, said apparatus comprising:

first and second rollers for transporting said medium; and

evaporating means for evaporating said material for deposit onto said medium between said first and second rollers at an oblique angle with respect to the surface of said medium;

said first roller being disposed closer to said evaporating means than said second roller, whereby said medium is transported past said evaporating means at an oblique angle;

an endless belt support surrounding said first and second rollers, said medium being supported on said endless belt support between said first and second roller; and

said first roller is smaller in diameter than said second roller and said second roller is a cooling rotary cylinder can for cooling said medium.

4,546,726

APPARATUS FOR REACTING A SEMICONDUCTOR WAFER WITH STEAM

Syuichi Nagasaka, Hiratsuka, and Siyoukichi Kaneko, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 26, 1983, Ser. No. 545,496

Claims priority, application Japan, Nov. 4, 1982, 57-192487

Int. Cl.⁴ C23C *13/08*

U.S. Cl. 118—719 **8 Claims**

1. An apparatus for reacting a semiconductor wafer with steam, comprising:

a reaction tube for placing the semiconductor wafer therein, said reaction tube having a free end and a coupling end and being disposed to be substantially horizontal;

a pipe, coupled to said coupling end of said reaction tube, for communicating with an interior said reaction tube;

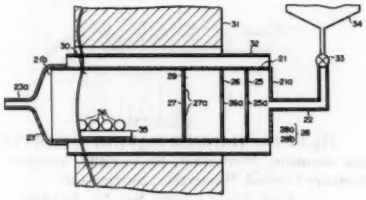
pure water supply means coupled to said pipe for supplying water to said reaction chamber;

heating means for heating said reaction tube;

a first chamber defined by a first partition plate in said reaction tube, said first partition plate being disposed in said

reaction tube to be spaced apart from said coupling end of said reaction tube and having a through hole, said first chamber being supplied with the pure water through said pipe, and the pure water being evaporated to generate steam by heat from said heating means;

a second chamber defined between said first partition plate and a second partition plate in said reaction tube, said second partition plate being disposed downstream of said first partition plate and having a through hole, the steam which is generated in said first chamber being supplied to said second chamber through said through hole in said first partition plate, and the steam in said second chamber being heated by the heat from said heating means, thereby generating superheated steam; and



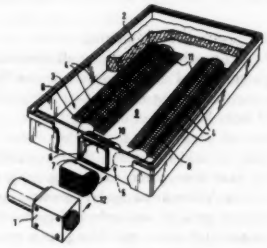
a third chamber defined by said second partition plate and downstream of said second chamber in said reaction tube, and third chamber being arranged such that the semiconductor wafer may be placed therein, the superheated steam being supplied from said second chamber to said third chamber through said through hole in said second partition plate, the superheated steam being further heated in said third chamber to a sufficient temperature for a reaction with the semiconductor wafer to occur, and the superheated steam being brought into contact with a surface of the semiconductor wafer and reacted steam flowing out from said free end of said reaction tube.

4,546,727

DEVICE FOR PREVENTING OR REDUCING EMITTANCE OF ODORS

Ib H. Andersen, Direktorsgatan 22, Helsingborg, Sweden S-252 46

Filed May 2, 1984, Ser. No. 605,940
Claims priority, application Sweden, May 4, 1983, 8302541
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—1 **10 Claims**



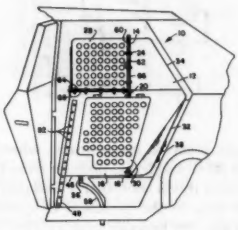
4. A device for preventing or reducing emittance of odors from moisture absorbent material to the environment, whereby the moisture absorbent material is intended for receiving animal excrements and urine, the device being of the type including means for generating an air stream which penetrates through the moisture absorbent material, a conduit means in communication with the air stream generating means, and a plurality of apertures in the conduit means, which device comprises a bottom for supporting the moisture absorbent material, the air stream generating means generates a pressurized air stream, and the conduit means being disposed to direct the pressurized air stream through the apertures before it penetrates through the moisture absorbent material.

4,546,728

ANIMAL TRANSPORTATION CONTAINER

Gary A. May, Clearwater, Fla., assignor to American K-9 Container Corporation, Safety Harbor, Fla.

Filed Jan. 19, 1984, Ser. No. 571,932
Int. Cl.[4] A01K *1/02*
U.S. Cl. 119—19 **18 Claims**



1. An animal transportation container for accommodation adjacent the rear seat bulkhead and a door of an automobile, the container comprising in combination:

a first receptacle element disposed adjacent the rear bulkhead of the automobile;

a first flange extending around the periphery of said first receptacle element;

a second receptacle element disposed in the space normally occupied by the rear seat support of the automobile;

a second flange extending around the periphery of said second receptacle element;

a first portion of said second flange disposed adjacent said first flange;

a first portion of said first flange disposed adjacent said first portion of said second flange;

a fastening means for fastening together said first portions of said first and said second flanges, respectively;

a closure receptacle disposed adjacent said first and second receptacle elements for closing said first and said second receptacle elements;

a first access means defined by the container, said access means being aligned with the door of the automobile for permitting the controlled ingress and egress of the animal relative the container; and

a second access means defined by said closure receptacle for permitting egress of the animal to a front seat of the automobile.

4,546,729

ARRANGEMENT FOR THE OPERATION OF A CHICKEN BROODER PLANT

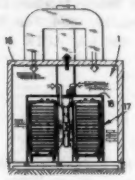
Arend J. Wormgoor, Diepenheim, Netherlands, assignor to A. J. Wormgoor B.V., Diepenheim, Netherlands

Filed Jun. 1, 1984, Ser. No. 616,306
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1983, 3320815
Int. Cl.[4] A01K *41/00*
U.S. Cl. 119—37 **2 Claims**

1. In an arrangement for the operation of a chicken brooder plant having a cart (4) conveyed on guideways (2,3) continually circulating through a brooder oven (17) constructed in elongated fashion, equipped with ventilating and heating apparatus (14) along with a loading and discharging arrangement (7), said cart carrying pivotably journaled trestles (8) accommodating the eggs to be incubated, said trestles being disposed

in several tiers over one another in the cart (4), the improvement comprising:

a. guideways (2,3) disposed on both sides of said ventilating and heating apparatus (14), said guideways (2,3) aligned parallel to one another, in turn being joined with one another at the ends thereof by means of transverse conveyor sections (5,6) and wherein said loading and discharging apparatus (7) for said trestles (8) is disposed at a location ahead of a head end of one of said guideways (3);



b. hydraulic pressure mechanisms, wherein conveying of said cart (4) through said brooder oven (17) is executed in passthrough travel such that a first cart (4), at any given time, as seen in the direction of conveying, is pushed forward into the brooder oven (17) by one cart width by said hydraulic pressure mechanism (9,10); and

c. a heat insulated oven chamber (1) within which is disposed said actual brooder oven (17), said actual brooder oven (17) being separated from an inner space of the oven chamber by good heat conducting sheetmetal (18) or the like.

4,546,730

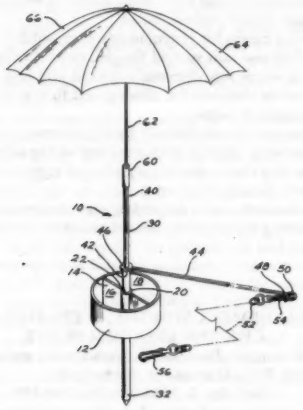
TANGLE-FREE PET HITCH AND FEEDING STATION

John D. Holland, Rte. 1, Scottsville, Ky. 42164

Filed Sep. 13, 1984, Ser. No. 650,138

Int. Cl.⁴ A01K *1/04*

U.S. Cl. 119—117 **4 Claims**



1. A small animal tether and feeding station assembly comprising:

a. a water and feed bowl having a vertical partition dividing the bowl into separate compartments, the said partition having a vertical through bearing positioned adjacent the center thereof; and

b. an elongated stake adapted to slide through the said through bearing in a close fit, the lower half of the stake being adapted to be driven into the ground beneath the bowl, while the upper half of the stake forms a vertical shaft; and

c. an umbrella having an elongated shaft supporting a collapsible shade, and coupling means joining the lower end of the umbrella shaft to the upper end of the stake;

d. the upper part of the stake having a supporting collar located closely adjacent the top of the bowl, and an elongated pole fitted at one end with a ring member that slips loosely over the top end of the stake and is pivotally supported on the said supporting collar, the other end of the elongated pole being adapted to rest upon the ground and fitted with a fixed length of flexible leash that is slightly shorter than the elongated pivoted pole for use in attachment at its other end to the collar of a small pet.

4,546,731

HEAT EXCHANGER HAVING A GAS FLUE

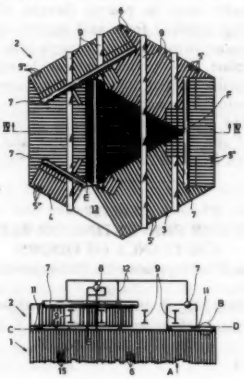
Heinz Ammann, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 23, 1984, Ser. No. 643,449

Claims priority, application Switzerland, Aug. 31, 1983, 4774/83

Int. Cl.⁴ F22B *37/00*

U.S. Cl. 122—367 R **9 Claims**



1. A heat exchanger comprising

a plurality of medium-carrying wall tubes extending parallel to a longitudinal axis to define a gas flue of polygonal cross-section having at least five sides with an even number of sides being of equal length;

said tubes of each alternating side of said flue being bent inwardly of said flue into a first horizontal plane at one end of said flue while extending in groups in parallel relation to define a triangular opening between each pair of adjacent groups, said tubes of each tube group in said first horizontal plane extending to a common line, each said line extending between two points coincident with points where the outermost tube of one group meets an outermost tube of an adjacent group, said lines enclosing an area filled with extensions of at least some of said tubes in said first plane; and

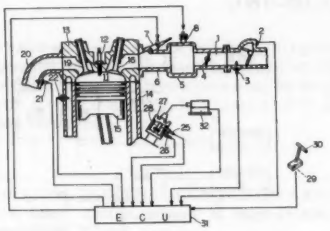
said tubes of the remaining sides of said flue being bent inwardly of said flue into a second horizontal plane at said end of said flue while extending in groups in parallel relation to cover each said triangular opening in said first horizontal plane.

4,546,732

FUEL INJECTION APPARATUS FOR CONTROLLING THE AMOUNT OF ALCOHOL AND GASOLINE SUPPLIED TO A MIXED FUEL ENGINE

Hisao Mae, and Kazuo Miyauchi, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Dec. 5, 1983, Ser. No. 557,929
Claims priority, application Japan, Mar. 9, 1983, 58-37300
Int. Cl.[4] F02D *19/08;* F02M *51/00*
U.S. Cl. 123—1 A 29 Claims



1. An apparatus for controlling the amount of alcohol and gasoline supplied to a combustion chamber of a mixed fuel engine, comprising:

a main fuel injection valve for injecting alcohol fuel to be supplied to the combustion chamber of an engine;

an auxiliary fuel injection valve for injecting gasoline fuel to be supplied to the combustion chamber of an engine;

a first detecting means for detecting temperature of a coolant in the engine;

a second detecting means for detecting whether the engine is idling;

a memory means for storing:

(1) a prescribed fuel rate ratio of alcohol to gasoline, which is to be injected into the engine upon determining by the first detecting means that the engine coolant temperature is less than or equal to a predetermined temperature and the second detecting means determines that the engine is not idling;

(2) a basic fuel rate ratio of alcohol to gasoline, which is to be injected into the engine upon determining by the first detecting means that the engine coolant temperature is greater than the predetermined temperature;

(3) a compensated fuel rate ratio of alcohol to gasoline, which is to be injected into the engine upon determining by the first detecting means that the engine coolant is less that a predetermined temperature and the second detecting means determining that the engine is idling;

a central processing unit connected for accepting data from the detecting means and the memory means, and therefrom calculating and transmitting injection signals to the main and auxiliary fuel injection valves for injecting calculated amounts of fuel dependent upon the detected parameters and the fuel rate ratios stored in the memory means; and

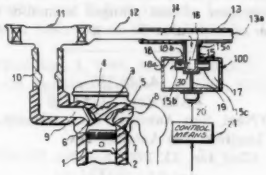
an actuating means for operating the main and auxiliary fuel injection valves in accordance with the signals from the central processing unit, whereby starting of the engine is improved by increasing the ratio of gasoline is alcohol in the combustion chamber.

4,546,733

RESONATOR FOR INTERNAL COMBUSTION ENGINES

Yasuhiko Fukami, Nishikasugai; Toshiichi Sawada, Kariya, and Shuzo Kinkori, Okazaki, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 21, 1984, Ser. No. 592,006
Claims priority, application Japan, Mar. 22, 1983, 58-47751; May 20, 1983, 58-89719
Int. Cl.[4] F02M *35/00*
U.S. Cl. 123—52 MB 13 Claims



1. A resonator for an internal combustion engine having intake and exhaust pipes connected with a cylinder of said internal combustion engine, said resonator comprising:

resonator means defining a predetermined closed volume for absorbing resonant noises generated in said engine,

a tubular connecting member means disposed between said resonator means and one of said pipes for forming a continuous passage from said one pipe to said resonator means, said tubular connecting member means including a tubular stem connecting to said one pipe at an opening thereof and a plurality of tubular branches extending from an outer surface of said tubular stem internally of said resonator means, the lengths of said tubular branches being different from each other, and

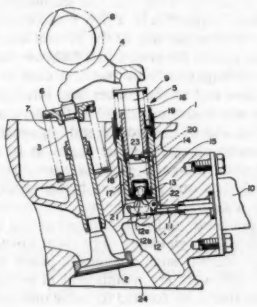
switch means connected with said tubular connecting member means for changing as between said different length tubular branches in accordance with operational conditions of said engine to absorb said noises from said engine.

4,546,734

HYDRAULIC VALVE LIFTER FOR VARIABLE DISPLACEMENT ENGINE

Hisashi Kodama, Nagoya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 11, 1984, Ser. No. 609,115
Claims priority, application Japan, May 13, 1983, 58-70600[U]
Int. Cl.[4] F02P *13/06*
U.S. Cl. 123—90.16 7 Claims



1. A hydraulic valve lifter for variable displacement engine comprising:

a hollow valve housing mounted on an engine cylinder head;

a working chamber and a reservoir chamber in said valve housing;

a one-way valve disposed within said valve housing for controlling fluid communication between said working and reservoir chambers;

means for actuating said one-way valve;

a sleeve member secured to an open end of said valve housing and having an axial bore therein; and

a plunger member slidably disposed in said axial bore of said sleeve member, one end of said plunger being disposed in said working chamber and the other end thereof being in co-operative contact with a valve rocker arm, wherein an outer diameter of said plunger is smaller than an inner diameter of said valve housing.

4,546,735

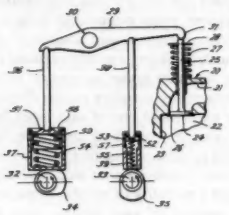
VALVE ACTUATOR

Glenn B. O'Neal, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Jan. 23, 1984, Ser. No. 572,875

Int. Cl.[4] F01L *1/34*

U.S. Cl. 123—90.17 **4 Claims**



1. In an internal combustion engine having a cylinder, a piston reciprocable within the cylinder to form a combustion chamber on one side thereof, a conduit connecting with the combustion chamber, a valve for opening and closing the conduit, including a valve seat about the conduit, a stem guidably reciprocable within the engine block, a valve head on the inner end of the stem for movement therewith toward and away from the seat, and spring means acting between the stem and block to urge the head toward the seat; an actuator for moving the head between conduit opened and closed positions, comprising a pivotally mounted rocker arm having one end engageable with the outer end of the stem, whereby the valve head is moved away from the seat to open the conduit upon pivoting of the rocker arm in one direction, and is permitted to move toward the seat to close the conduit upon pivoting of the rocker arm in the opposite direction, first and second shafts rotatable about their axes, first and second cams on the first and second shafts, respectively, a first rod connected at one end to the rocker arm on the side of the pivotal axis of the arm opposite the one end of the arm, a first follower on the other end of the first rod engageable by the first cam, a second rod connected at one end to the rocker arm intermediate the pivotal axis of the arm and the one end of the arm, a second follower on the other end of the second rod engageable by the second cam, means so connecting the shafts as to permit the phase angles between the cams to be continuously varied, the first and second rods and followers being axially extendible and retractible with respect to one another between extended and retracted positions, and spring means acting between each rod and its follower to yieldably urge them toward one such position so that, despite such changes in phase angle between the cams, the followers are maintained in engagement with the cams as the shafts are rotated to cause one rod and its follower to pivot the rocker arm in one direction and the other rod and its follower to pivot the rocker arm in the other direction, the spring means acting between the rod and its follower which pivots the rocker arm in said one direction providing a force which overcomes the force acting between the stem and block but yields to the force exerted by the other rod and follower pivoting the rocker arm in said opposite direction if both rods and followers exert opposing forces simultaneously on the rocker arm.

4,546,736

FUEL SUPPLY CONTROL SYSTEM

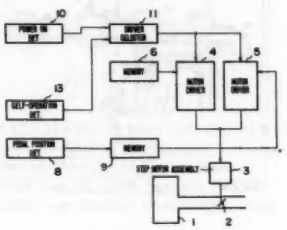
Kouichi Moriya; Kouki Iwata, and Hideyasu Takefuta, all of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1984, Ser. No. 585,587

Claims priority, application Japan, Mar. 4, 1983, 58-034401

Int. Cl.[4] F02N *17/00;* **F02B** *3/00;* **F02D** *11/10, 1/04*

U.S. Cl. 123—179 G **3 Claims**



1. A fuel supply control system for controlling an amount of fuel supplied to an internal combustion engine by driving a step motor operatively coupled to fuel supply control means of the engine, comprising:

(a) power-on detector means for detecting when a main power supply voltage is applied;

(b) engine self-operation detector means for detecting when the engine is operating by itself;

(c) an accelerator-pedal position detector means for detecting a position to which an accelerator pedal is depressed;

(d) initial step position setting memory means for storing an initial preset step position of the step motor;

(e) target step position memory means for storing a target step position of the step motor corresponding to said position to which the accelerator pedal is depressed;

(f) first step motor driver means for driving the step motor stepwise to the initial preset step position stred in said initial step position setting memory means;

(g) second step motor driver means for driving the step motor stepwise to the target step position stored in said target step position memory means; and

(h) selector means for selecting said first step motor driver means in response to a signal from said power-on detector means and for selecting said second step motor driver means in response to a signal from said engine self-operation detector means.

4,546,737

VALVE-SEAT INSERT FOR INTERNAL COMBUSTION ENGINES

Koji Kazuoka; Testuya Suganuma, both of Toyota; Naoki Motooka, and Nobuhito Kuroishi, both of Itami, all of Japan, assignors to Sumitomo Electric Industries, Ltd. and Toyota Motor Corporation, both of, Japan

Filed Jun. 29, 1984, Ser. No. 626,124

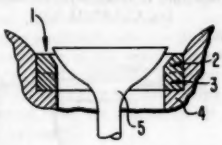
Claims priority, application Japan, Jul. 1, 1983, 58-120457; Jul. 1, 1983, 58-120458

Int. Cl.[4] F01L *3/02*

U.S. Cl. 123—188 S **4 Claims**

1. A valve-seat insert for internal combustion engines comprising a double layered, sintered alloy composed of a valve-seat layer on which a valve is seated, and a base layer inte-

grated with the valve-seat layer and adapted to be seated in a cylinder head of the engine, said valve-seat layer being composed of a sintered alloy of a high heat resistance and a high wear resistance, said base layer being composed of a sintered alloy having a radial crushing strength which is higher than



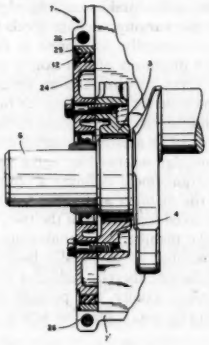
that of the valve-seat layer and not less than 100 kgf/mm^2 at room temperature, but not less than 80 kgf/mm^2 at 500° C., said sintered alloy of the base layer comprising, by weight, 11 to 15% or Cr, 0.4 to 2.0% of Mo, 0.05 to 0.3% of C, and the balance being substantially Fe.

4,546,738

RECIPROCATING INTERNAL COMBUSTION ENGINE

Tomas Visek, Steyr, Austria, assignor to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Feb. 15, 1984, Ser. No. 580,466
Claims priority, application Austria, Feb. 25, 1983, 663/83
Int. Cl.^{4} F16M *1/02*
U.S. Cl. 123—195 C **2 Claims**



1. In an internal combustion engine, the combination which comprises:

a drive assembly constituted by

a main bearing, and

a crankshaft journaled in said main bearing and rotatable about a crankshaft axis and provided with pistons and connecting rods for displacing the crankshaft;

an outer pan sealed with respect to said assembly and provided with a pair of pan parts having a dividing plane extending along said axis and defining an opening;

a sound-transmission insulating element lying in a second plane perpendicular to said axis and to said dividing plane disposed within said opening in said outer pan, said element comprising:

a rigid ring attached to said bearing by bolts which traverses said ring perpendicular to said second plane, and

a resilient ring bonded to said rigid ring and peripherally retained by said outer pan solely by clamping between said parts; and

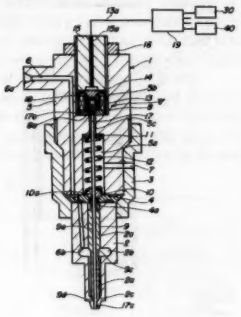
bolts on opposite sides of said crankshaft extending perpendicular to said dividing plane and substantially in said second plane for drawing said parts together to provide the clamping force retaining the outer periphery of said resilient ring in said outer pan.

4,546,739

FUEL INJECTION VALVE WITH VARIABLE DISCHARGE AREA OF NOZZLE HOLES

Nobuyuki Nakajima, and Keiichi Yamada, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Aug. 1, 1984, Ser. No. 636,828
Claims priority, application Japan, Aug. 10, 1983, 58-146135
Int. Cl.^{4} F02M *61/20*
U.S. Cl. 123—299 **5 Claims**



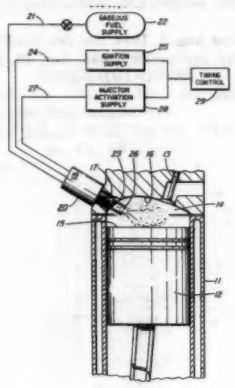
1. A fuel injection valve for an internal combustion engine, comprising: a nozzle body having a tip, said nozzle body having at least one first nozzle hole and at least one second nozzle hole formed therein, said at least one second nozzle hole being located closer to the tip of said nozzle body than said at least one first nozzle hole; a first valve fitted in an axial hole formed in said nozzle body for axial movement therealong to alternately close and open said at least one first nozzle hole as a nozzle needle; a second valve fitted in an axial hole formed in said first valve for axial movement therealong to selectively close or open said at least one second nozzle hole; a nozzle spring urging said first valve against said at least one first nozzle hole to set the valve opening pressure thereof at a predetermined value; and control means for controlling the operation of said second valve in response to operating conditions of said engine such that said at least one second nozzle hole is opened by said second valve when said engine is operating in at least one predetermined operating region; said nozzle body having an axial through hole formed in the tip thereof and having a peripheral wall, said at least one second nozzle hole having an inner end thereof terminating in the peripheral wall of said axial through hole, said second valve comprising a spool valve having a first land axially extending from said first valve toward the tip of said nozzle body and disposed to selectively assume a seated position wherein said first land is fitted in an end of said axial through hole closer to said first valve to close said at least one second nozzle hole, and a lifted position wherein said first land is disengaged from said axial through hole to open said at least one second nozzle hole, an annular groove adjacent said first land and disposed in said axial through hole at a location such that it permanently faces said inner end of said at least one second nozzle hole, and a second land adjacent said annular groove and opposed to said first land with respect to said annular groove, said second land being permanently positioned within said axial through hole.

4,546,740

IGNITION SOURCE FOR INTERNAL COMBUSTION ENGINE

Reginald M. Clements; John D. Ridley, and Philip L. Pitt, all of Victoria, Canada, assignors to University of Victoria, Victoria, Canada

Filed Jun. 28, 1983, Ser. No. 508,512
Claims priority, application Canada, Apr. 11, 1983, 425623
Int. Cl.⁴ F02D *3/00;* **F02B** *19/10, 45/08*
U.S. Cl. 123—304 **7 Claims**



1. An improved ignition system for an internal combustion engine having a combustion chamber and means for feeding an ambient fuel-air combustible mixture to said combustion chamber by a conventional fuel injection system or by a conventional gas mixing system, the ignition system comprising an injection electrode assembly consisting essentially of:

(i) an injector nozzle provided with a fast-acting valve opens in 10–20 microseconds;

(ii) a source of gaseous fuel which is gaseous at normal room room temperature and at five to six times normal atmospheric pressure;

(iii) means for feeding the gaseous fuel from the source to the injector nozzle;

(iv) means for actuating said fast-acting valve;

(v) a spark electrode for providing a spark gap, said spark electrode projecting a predetermined distance into said combustion chamber so that the axis of the injector nozzle passes through said spark gap, whereby a puff in the form of a short, abrupt blast of said gaseous fuel is expelled across said spark to produce a well-defined turbulent plume of injected gaseous fuel, mixed with ambient fuel-air combustible mixture in the combustion chamber;

(vi) means for supplying electrical energy to said spark electrode; and

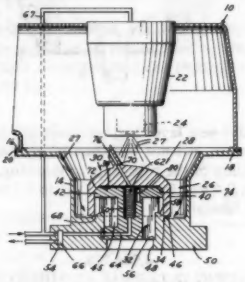
(vii) means for controlling the time and duration of the electric spark and said fast-acting valve actuating means to control the length of time it takes to open said fast-acting valve and the length of time said fast-acting valve remains open so that said electric spark occurs after an appropriate predetermined time after the opening of said fast-acting valve, when said turbulent plume passes in the vicinity of said spark electrode, so that said ambient fuel-air mixture and said injected gaseous fuel in the combustion chamber are simultaneously ignited.

4,546,741

THROTTLE BODY WITH SLIDABLE THROTTLING VALVE

Duane M. Grider, Detroit, and Theodore W. Daykin, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 7, 1985, Ser. No. 689,128
Int. Cl.⁴ F02D *9/08*
U.S. Cl. 123—337 **7 Claims**



1. A central fuel injection type fuel feed system for an automotive type internal combustion engine including an air/fuel throttling body having wall means defining an air/fuel induction passage therethrough open at one end to air essentially at an atmospheric pressure level and adapted to be connected at its opposite end to the intake manifold of the engine to subject the passage to the varying vacuum levels therein, a fuel injector means concentrically positioned in the passage near the inlet thereto for discharge of fuel axially into the passage with a conical-like spray pattern, and an air/fuel throttling valve means in the passage for controlling the flow of air and fuel to the intake manifold, the valve means including an interengaging arrangement of an axially moveable dome-like valve member with an annular washer-like valve seat having a central opening, the arrangement defining a controlled air/fuel flow path between the member and valve seat varying in area as a function of the axial separation of the two, and aperture means in the dome-like member communicating the air to opposite sides of the member to essentially balance the pressure on opposite sides thereof, thereby reducing the force necessary to move the member axially, the passage of fuel through the controlled path effecting a shearing action of the fuel for atomizing the fuel.

4,546,742

TEMPERATURE CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Fred D. Sturges, Rockford, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jan. 23, 1984, Ser. No. 573,190
Int. Cl.⁴ F01P *3/12, 11/10*
U.S. Cl. 123—41.05 **3 Claims**

1. A temperature control system for an internal combustion engine having a radiator for cooling engine coolant, which flows around the engine jacket, and having first and second heat exchangers, in front of or within the radiator, for cooling first and second fluids, respectively, used in the engine, the coolant and the two fluids each having a different desired operating temperature range to achieve optimum engine performance, said temperature control system comprising:

first temperature sensing means for sensing the coolant temperature and producing a first temperature signal having an amplitude which is directly proportional to and representative of the relative level of the sensed coolant temperature within the coolant's operating temperature range;

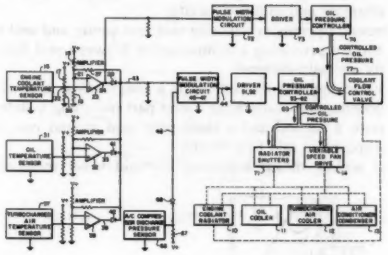
second temperature sensing means for sensing the temperature of the first fluid and producing a second temperature signal having an amplitude which is directly proportional to and representative of the relative level of the sensed fluid temperature within the fluid's operating temperature range;

third temperature sensing means for sensing the temperature of the second fluid and producing a third temperature signal having an amplitude which is directly proportional to and representaive of the relative level of the sensed fluid within the fluid's operating temperature range;

a coolant flow control valve for controlling the amount of coolant diverted from the engine jacket and circulated through the radiator;

controllable radiator shutters for adjusting the amount of ram air impinging on the radiator and the two heat exchangers;

a variable speed fan drive for blowing a controlled amount of air through the radiator and the first and second heat exchangers;



means coupled to said first temperature sensing means for controlling said coolant flow control valve in response to said first temperature signal in order to maintain the coolant temperature within the desired operating temperature range;

means coupled to said first, second and third temperature sensing means for effectively selecting the particular one of the three temperature signals having the highest amplitude;

and means responsive to the selected temperature signal, when the signal's amplitude is within a predetermined relatively low amplitude range, for controlling said radiator shutters to adjust the amount of ram air striking the radiator and the first and second heat exchangers, and responsive to the selected temperature signal, when the signal's amplitude is within a predetermined relatively high amplitude range, for controlling said variable speed fan drive to vary the amount of air pulled in through the radiator and the first and second heat exchangers.

4,546,743

ARRANGEMENTS TO ROTARY VALVES FOR ENGINES COMPRESSORS, MOTORS OR PUMPS

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 807,975, Jun. 20, 1977, abandoned. This application Apr. 1, 1982, Ser. No. 364,574

Int. Cl.[4] **F01L** *7/02*

U.S. Cl. 123—190 A **5 Claims**

1. A valve arrangement including a rotary valve member (**3,110**) with a cylindrical outer face (**330**) is provided in a valve-bearing body (**9,112**);

wherein said body includes a valve-bearing bed of a hollow cylindrical configuration with a cylindrical inner face (**333**) of a constant radius about a longitudinal first axis;

wherein said valve member has a longitudinal second axis; and the cylindrical outer face of said member is formed by a second radius around said second axis,

wherein said valve member is located in said bearing bed and able to revolve in said bed around said second axis;

wherein said second axis substantially coincides with said first axis when said member is inserted into said bed,

wherein said second radius is substantially equal to said first radius, but very slightly shorter than said first radius to provide a narrow clearance between said outer face and said inner face;

wherein said valve-bearing body is provided with an entrance port;

wherein said rotary valve member is provided with at least one transfer passage (**4,148,149**);

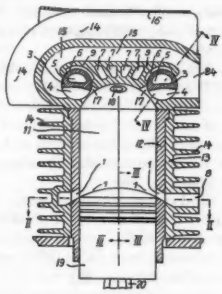
wherein an inlet passage (**8,15,25**) is provided from said inlet port (f.e. **84**) towards a portion of said outer face (**380**);

wherein said transfer passage extends through a portion of said member and through said outer face of said member;

wherein said valve-bearing body is provided with at least one transfer-channel (**17,37,115**) which is relative to said second axis located substantially radially of said transfer passage of said rotary valve member to periodically communicate and discommunicate with said transfer passage of said member, when said rotary valve member revolves in said bed of said valve-bearing body;

wherein pockets (**23,153**) are provided in said body with at least one pair of pockets provided in said body, while said pockets are open towards said outer face of said member,

wherein one of said pockets is relatively to said axes axially



distanced in one axial direction from said transfer passage while the other pocket of said pair of pockets is distanced from said transfer passage in the other axial direction relative to said axes,

wherein said pockets are distanced substantially in equal lengths but oppositional axial directions from said transfer passage;

wherein said pockets are radially relative to said axes diametrically oppositionally located relative to said transfer channel;

wherein the clearance between said inner face and said outer face forms sealing lands around said transfer channel and around said pockets;

wherein said pockets are subjected to pressure in fluid and filled with fluid;

wherein said pressure in said fluid in said pockets extends in them gradually decreasing into said sealing lands around said pockets and the fluid pressure in said passage channel extends in it gradually decreasing into said sealing land around said transfer channel; whereby said pressures in said sealing lands form means value areas of pressure zones with pressures equal to said pressures in said pockets and in said transfer channel; and;

wherein the sum of the cross-sectional areas of the pressure zones of said pockets multiplied with the pressure therein corresponds substantially to the cross-sectional area of the pressure zone of said transfer channel multiplied by the pressure therein;

whereby said rotary valve member revolves in said bed of said valve bearing body substantially floating between said zones;

whereby said rotary valve member is substantially free of resulting radial forces to permit it to resolve substantially without friction between said inner face and said outer face, but to revolve instead between the fluids and pressures in said zones;

wherein a multiple fluids separation valve arrangement, (f.e. **769,166** or **85,**) is communicated to said transfer channel and to said pockets;

wherein said pockets are communicated to a second fluid different from the first fluid in said transfer channel;

wherein said separation valve arrangement separates said second fluid from said first fluid, but controls the pressure in said pockets to maintain at all times at least periodically a parallelity of the rates of pressure in said fluids in said channel and in said pockets;

wherein said separation valve arrangement includes in a portion of a body a control cylinder **(84)** open at the first end thereof towards a portion of an outer face **(333)** of a moving member **(93,3,110,310)**;

wherein a reciprocable control piston **(85)** is provided in said control cylinder **(84)**;

wherein a thrust piston, also called: "element" **(90)** is provided axially of said control piston close to said first end of said control cylinder in said contol cylinder, whereby a top chamber **(84)** appears in said control cylinder close to the second end thereof and on the top end of said control piston **(85)**, while a bottom chamber **(94)** appears between said control piston **(85)** and said element **(90)** in said control cylinder;

wherein a spring **(87)** is interposed between said control piston **(85)** and said element **(90)**;

wherein a medial collection groove **(86)** meets a medial portion of said control piston **(85)** and a second communication passage **(86)** extends from said medial groove;

wherein a first communication passage **(82)** extends from said top chamber **(84)**;

wherein a third communication passage **(89)** extends from a fluid supply source of a third pressure into said bottom chamber **(94)** of said control cylinder;

wherein a one-way check valve **(88)** is provided in said third communication passage **(89)**; and;

wherein said second communication passage **(86)** is communicated to a room under substantially low pressure, while said first communication passage is communicated to a room containing a second pressure;

whereby said control piston oscillates under said second and third pressures in said chambers **(84)** and **(94)** and under the force of said spring to open and close said second communication passage and to increase and decrease the volumes of said chambers, while said element (thrust piston) **(90)** is pressed with its bottom portion against a respective face **(330)** of said moving member **(93,3,110,310)**.

4,546,744

ELECTROMECHANICAL AND PNEUMATIC DEVICE FOR CONTROLLING THE THROTTLE POSITION OF A CARBURETOR ACCORDING TO ENGINE SPEED DURING ACCELERATOR RELEASE

Silverio Bonfiglioli, Zola Predosa, Italy, assignor to Weber S.p.A., Torino, Italy

Filed Feb. 6, 1984, Ser. No. 577,013

Claims priority, application Italy, Feb. 18, 1983, 3342 A/83

Int. Cl.[4] **F02M** *3/06;* **F02D** *31/00*

U.S. Cl. 123—339 **4 Claims**

1. An apparatus for controlling a position of a carburetor throttle as a function of engine speed during accelerator release, comprising:

a housing including a first portion in which a vacuum motor is disposed and a second portion in which an electromagnet is disposed, said vacuum motor comprising a first and a second chamber hermetically divided from each other by an elastic diaphragm, said diaphragm including a stiffened middle portion comprising a pair of small plates, said vacuum motor including a first wall having a first opening for providing communication between said first chamber and an ambient surrounding said apparatus, said vacuum motor including a second wall having pipe means therein for providing communication between an intake manifold of said engine and said second chamber in order to transmit a vacuum existing in said manifold to said second chamber;

a first spring disposed in said second chamber, for biasing said diaphragm against action of said vacuum;

first and second stopping means disposed respectively in said first and second chambers, for stopping movement of said diaphragm between limit positions under action of said vacuum and said bias of said first spring;

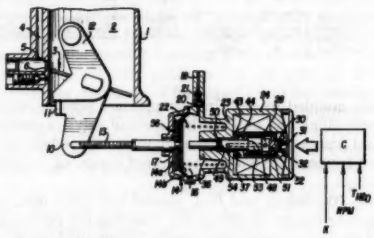
a first cavity disposed in said second portion of said housing;

a first passage connecting said second chamber and said first cavity, for providing communication between said second chamber and said first cavity;

a second opening connecting said first cavity and said ambient, for providing communication between said first cavity and said ambient;

a valve member coaxial with a longitudinal axis of said housing and comprising a first part including a slide support, a second and a third part, said second part being disposed in said first cavity;

first sealing means supported by said valve member, for



closing said first passage to prohibit said communication between said second chamber and said first cavity;

a throttle shaft on which said throttle is fixed such that said throttle rotates with said shaft;

a first lever connected to said shaft of said throttle;

a rod fixed to said middle portion of said diaphragm and crossing said slide support in said first part of said valve member, said rod extending substantially coaxially with said longitudinal axis of said housing, to act on said first lever connected to said shaft of said throttle;

control means for energizing said electromagnet device, said control means being electrically connected with at least a first sensor for sensing cooling water temperature of said engine, a second sensor for sensing an R.P.M. value of said engine, a third sensor for sensing a power load applied to said engine, when an accelerator is released, and said electromagnet device;

a bushing comprising a second cavity, said bushing constituting a movable keeper associated with said electromagnet device, said third part of said valve member being slidably disposed in said bushing;

a second spring disposed in said first cavity for biasing said movable keeper against an action of said electromagnet when said electromagnet is energized;

second sealing means supported by said bushing, for closing said second opening under said biasing action of said second spring;

conduit means disposed in said first cavity, for providing

communication between said second opening and said first passage;

a third spring disposed in said second cavity, for biasing said valve member against inertial forces of said valve member;

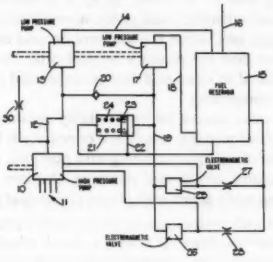
said first part of said first valve member being disposed in said second chamber and cooperating with said stiffened middle portion of said diaphragm in order to position said diaphragm.

4,546,745

FUEL PUMPING APPARATUS

Colin P. Brotherston, Rainham, England, assignor to Lucas Industries public limited company, Birmingham, England

Filed Dec. 12, 1983, Ser. No. 560,512
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—387 **11 Claims**



1. A fuel pumping apparatus for supplying fuel to an internal combustion engine comprising a high pressure pump operable in use, in timed relationship with the engine, a low pressure pump having an outlet for supplying fuel to the high pressure pump, means operable to control the amount of fuel supplied to the engine, said means including a surface against which liquid under pressure can act to vary the setting of said means, a fuel reservoir, and a further low pressure pump having an outlet which draws fuel from the lower portion of said reservoir, the output of said further low pressure pump being utilized to provide the pressure on said surface, and the outlets of said low pressure pumps being interconnected through a one way valve which allows flow of fuel from the outlet of the first mentioned low pressure pump to the outlet of the further pump.

4,546,746

INJECTOR FOR MULTICYLINDER INTERNAL COMBUSTION ENGINES

Toshihiko Sato, Saitama, and Tetsuo Yamagata, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1984, Ser. No. 644,917
Claims priority, application Japan, Sep. 3, 1983, 58-162142
Int. Cl.[4] F02M *39/00*; F02D *13/06*
U.S. Cl. 123—478 **2 Claims**

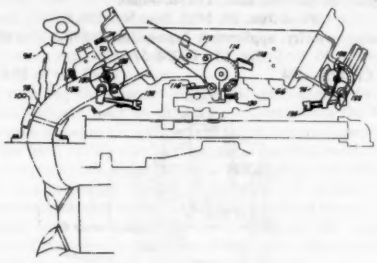
1. An injector system for an engine having a first cylinder bank with a first intake manifold and a first throttle valve associated therewith and a second cylinder bank with a second intake manifold and a second throttle valve associated therewith, the first and second throttle valves having a common throttle control, comprising

a first pressure sensor in communication with the first intake manifold downstream of the first throttle valve;

a second pressure sensor in communication with the second intake manifold downstream of the second throttle valve;

first fuel injectors, each said first fuel injector being directed to a cylinder of the first cylinder bank;

second fuel injectors, each said second fuel injector being directed to a cylinder of the second cylinder bank; and



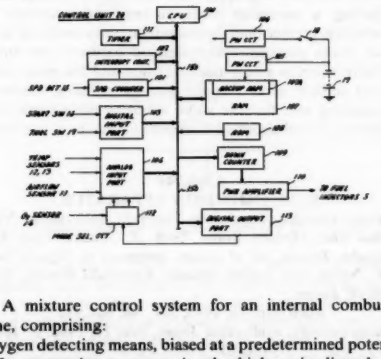
injector control means for controlling said first injectors responsive to said first pressure sensor and said second injectors responsive to said second pressure sensor.

4,546,747

LEAN MIXTURE CONTROL SYSTEM USING A BIASED OXYGEN CONCENTRATION SENSOR

Akio Kobayashi, Kariya; Susumu Harada, Okazaki; Takashi Harada, Hekinan; Takehiro Kikuchi, Oobu, and Masakazu Honda, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 5, 1984, Ser. No. 617,476
Claims priority, application Japan, Jun. 7, 1983, 58-102113
Int. Cl.[4] F02M *7/00*; F02B *3/00*
U.S. Cl. 123—489 **10 Claims**



1. A mixture control system for an internal combustion engine, comprising:

oxygen detecting means, biased at a predetermined potential, for generating a sensor signal which varies linearly as a function of the oxygen concentration of exhuast emissions from said engine when the air-fuel ratio of mixture supplied thereto is leaner than stoichiometric value;

engine parameter detecting means for detecting engine operating parameters;

memory means for storing a plurality of optimum values of said signal in storage locations addressable as a function of said detected engine operating parameters; and

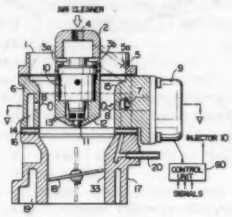
processing means for determining the quantity of fuel to be supplied to said engine in accordance with said detected engine operating parameters, for addressing said memory means as a function of said detected engine operating parameters to derive one of said optimum values, for detecting a difference between said generated sensor signal and said one of optimum values derived from said memory means, and for integrating said difference and correcting the fuel quantity with the integrated value.

4,546,748

FUEL INJECTION SYSTEM

Kimiji Karino, and Tokuo Kosuge, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 30, 1983, Ser. No. 509,393
Claims priority, application Japan, Jul. 2, 1982, 57-115969
Int. Cl.[4] F02M *51/00*
U.S. Cl. 123—494 **19 Claims**



1. A fuel injection system for an internal combustion engine comprising:

means defining an intake passage;

a throttle valve disposed in said intake passage and adapted to control the flow rate of air to be sucked into the engine;

a fuel injector disposed in said intake passage upstream of said throttle valve and adapted to supply fuel into said engine;

means in said intake passage for supporting said fuel injector therein;

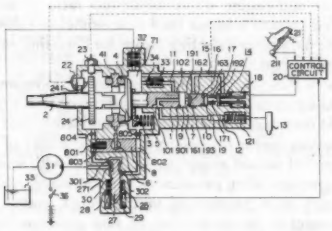
said injector supporting means having an outer peripheral survace spaced inwardly from the inner peripheral surface of said intake passage defining means to cooperate therewith to define a generally annular intake passage section having a minimum unobstructed cross-sectional area which is greater than the maximum cross-sectional area of an intake passage section defined between said throttle valve when in a fully open position and the inner peripheral surface of said intake passage defining means surrounding said throttle valve whereby undesirable whirling-up of fuel about said supporting means is avoided.

4,546,749

FUEL INJECTION APPARATUS

Toshihiko Igashira, Toyokawa; Yasuyuki Sakakibara, Nishio; Seiko Abe; Hiroshi Koide, both of Okazaki, and Kazuo Shinoda, Toyota, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kabushiki Kaisha, Tokyo, both of, Japan

Filed Sep. 16, 1983, Ser. No. 532,912
Claims priority, application Japan, Sep. 17, 1982, 57-160776
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—506 **4 Claims**



1. A fuel injection apparatus for an internal combustion engine to feed fuel to a fuel injection valve, comprising:

casing means for housing a first cylinder therein;

a plunger slidably provided within said first cylinder to define therein a pumping chamber to feed under pressure fuel from said pumping chamber to said fuel injection valve;

means for feeding fuel in a fuel tank into said pumping chamber;

means for selectively spilling a portion of said fuel from said pumping chamber, said spilling means including

a second cylinder which is communicated with said pumping chamber,

a piston slidably provided in said second cylinder,

a first passage for spilling said fuel, and

a second passage to which pressure of a low pressure chamber formed in said casing means can be led, said first passage being opened and closed by said piston, one end face of said piston being acted on by pressure of said pumping chamber, the other end face of said piston being able to be acted on by a pressure of said low pressure chamber, said piston normally closing said first passage and, when the pressure on said one end face is higher than the pressure on said other end face, being displaced to open said first passage; said apparatus further comprising

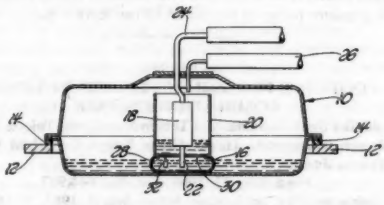
solenoid valve means for controllably opening and closing said second passage, wherein a concavity is formed in the end face of said piston facing said pumping chamber, and the pressure within said pumping chamber acts on only said concavity when said piston closes said first passage.

4,546,750

SECONDARY RESERVOIR FOR A FUEL TANK

Jack W. Brunell, Byron, and Robert W. Stein, East Lansing, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 12, 1984, Ser. No. 630,260
Int. Cl.[4] F02M *39/00*
U.S. Cl. 123—514 **2 Claims**



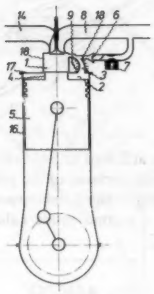
1. An improvement in fuel reservoirs having a submerged pump member which draws fluid from the interior of a filter and delivers the fluid to an engine and wherein a fuel return line from the engine dispenses excess fuel into a fuel tank having a floor wherein the improvement comprises; a secondary reservoir surrounding the fuel pump and being located to receive the return fuel from the engine and displaced vertically from the floor; and an inertia responsive valve means operatively connected between the secondary reservoir and the interior of the filter for permitting fuel in said secondary reservoir to enter the interior of the filter and the pump inlet when the vehicle carrying the fuel tank undergoes acceleration.

4,546,751

METHOD OF PREPARING A COMBUSTIBLE MIXTURE IN AN INTERNAL COMBUSTION PISTON ENGINE

Stanislaw Jarnuszkiewicz, and Marek Jarnuszkiewicz, both of Kraków, Poland, assignors to Politechnika Krakowska, Krakow, Poland

Continuation of Ser. No. 365,677, Apr. 5, 1982, abandoned. This application Aug. 31, 1984, Ser. No. 646,481
Claims priority, application Poland, Apr. 24, 1981, 230855
Int. Cl.[4] F02M *33/00*
U.S. Cl. 123—568 **1 Claim**



1. In a method of preparing an enhanced combustible mixture for an internal combustion piston engine, having a cylinder with a cylinder head, a piston movable in said cylinder between a bottom dead center position and a top dead center position, a working space defined by the surfaces of the cylinder, of the piston and of the cylinder head, said engine being controlled by timing means and operable through cyclical strokes which include intake, compression, combustion and exhaust, the improvements which comprise the steps of: connecting said working space to a source of air before said compression stroke; producing a mixture of exhaust gases and atomized fuel droplets and supplying said exhaust gas and fuel mixture to a storage space closely adjacent to but separate from said working space of the engine; then during said compression stroke in the working space, providing for a laminar inflow of air by virtue of positive displacement of the fuel and exhaust gas mixture in the storage space and compressing the same so that the mixture maintains a non-combustible chemical composition in said storage space during said compression stroke; and as said piston approaches said top dead center position which terminates said compression stroke, applying said mixture with said air flow to produce a sudden pressure increase in said storage space causing immediate pumping into said working space of said mixture of fuel and air for subsequent combustion therein.

4,546,752

PREMIXED CHARGE CONDITIONER FOR INTERNAL COMBUSTION ENGINE

Richard F. Blaser, and Walter L. Blaser, both of 214 Pierce Ave., Cape Canaveral, Fla. 32920

Filed Nov. 10, 1983, Ser. No. 550,568
Int. Cl.[4] F02M *25/06*
U.S. Cl. 123—568 **25 Claims**

1. A process for conditioning a premixed liquid fuel and air charge supplied to the working chamber of an Otto cycle internal combustion engine that includes a charge supply duct, an exhaust conduit and a charge forming device including a throttle in the charge intake conduit comprising:

(a) supplying a premixed charge of mixed liquid fuel and air to the charge supply duct using the charge forming device;

(b) establishing a first vacuum signal at the charge supply duct proportional to engine intake manifold absolute pressure;

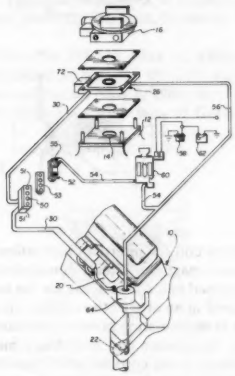
(c) supplying exhaust gases under pressure from the engine exhaust conduit to an exhaust gas supply conduit having a fixed orifice restriction of predetermined cross-sectional area downstream of the inlet thereof;

(d) drawing exhaust gas into the charge supply duct downstream of the fixed orifice;

(e) controlling the quantity of exhaust gas supplied to the charge supply duct by directly communicating the first vacuum signal to the exhaust gas supply conduit upstream of the fixed orifice via the exhaust gas supply conduit; and

(f) further controlling the quantity of exhaust gas supplied to the charge supply duct by regulating the exhaust gas pressure upstream of the fixed orifice so that at least at low engine load operating conditions, including idle, engine exhaust gas pressure upstream of the fixed orifice is raised above normal in the exhaust supply conduit.

8. A charge conditioner system for supplying exhaust gas to the intake fuel and air charge of an internal combustion engine to promote vaporization of the fuel component of the charge and improved volumetric efficiency, the engine including a charge supply duct communicating with an engine intake port or ports for supplying a charge prepared by a charge forming means to the port(s), a throttle means for controlling the flow of charge through the charge supply duct, and an exhaust



manifold constituting the source of supply of exhaust gas, comprising:

an exhaust gas supply conduit having an inlet end in communication with the engine exhaust manifold and an outlet end in communication with the charge supply duct;

a fixed orifice having a preselected cross-sectional area in the exhaust gas supply conduit for restricting full flow of exhaust gas passing through the conduit from the exhaust manifold to the charge supply duct;

exhaust gas pressure regulator means associated with the exhaust manifold for controlling the exhaust gas pressure in the exhaust gas supply conduit upstream of the fixed orifice;

means for controlling said exhaust gas pressure regulator in response to engine operating conditions;

a venturi body including a restricted throat disposed in the charge supply duct downstream of the throttle means, the venturi body arranged so that the intake charge passes primarily through the venturi throat, the venturi having a total flow capacity substantially equivalent to the flow capacity of the charge-forming means;

the outlet end of said exhaust gas supply conduit communicating with said charge supply duct downstream of said venturi throat;

whereby intake vacuum in the charge supply duct establishes an absolute pressure in the exhaust gas supply con-

duit downstream of the fixed orifice that is less than the absolute pressure established upstream of the fixed orifice by operation of the engine and by regulation of the exhaust gas pressure regulator to thereby draw exhaust gas into the charge supply duct in a controlled manner and to cause its intimate mixing with the charge intake.

4,546,753

IGNITION COIL FOR INTERNAL COMBUSTION ENGINES

Jean M. Pierret, Paris, France, assignor to Ducellier & Cie, Créteil, France

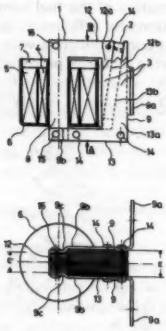
PCT No. PCT/FR83/00131, § 371 Date Apr. 5, 1984, § 102(e) Date Apr. 5, 1984, PCT Pub. No. WO84/00843, PCT Pub. Date Mar. 1, 1984

PCT Filed Jul. 1, 1983, Ser. No. 600,638

Claims priority, application France, Aug. 11, 1982, 82 13965

Int. Cl.⁴ F02P *3/02*; H01F *27/30*

U.S. Cl. 123—634 **4 Claims**



1. An ignition coil for internal combustion engines, the coil having a closed magnetic circuit constituted by metal sheets which are stamped and stacked one on the other; a permanent magnet disposed in an arm of the circuit; primary and secondary windings in an insulating housing surrounding another arm of the circuit, the ignition coil including a magnetic flux shunt circuit, the circuit being constituted by plates of mild steel, the coil being characterized in that the closed magnetic circuit includes a first part, of thickness E' and U-shaped, of which one of the portions is stamped with a chamfered edge and a second part of thickness E greater than the thickness E', which second part is L-shaped and has a portion which is stamped with a chamfered edge, the permanent magnet being inserted between the chamfers of the first and second parts, and the first and second parts being rigidified by extensions of the metal plates, and by rivets extending through said extensions and through the stacked sheets.

4,546,754

YOKE ANCHOR FOR COMPOUND BOWS

Max D. Smith, Evansville, Ind., assignor to Indian Industries, Inc., Evansville, Ind.

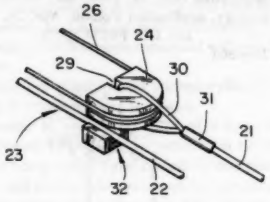
Filed May 23, 1983, Ser. No. 497,021

Int. Cl.⁴ F41B *5/00*

U.S. Cl. 124—86 **8 Claims**

1. A yoke anchor for securing a first inside cable of a compound bow to the tip of one of the bow limbs, the compound bow including a yoke cable connected at its free ends to the pulley axle, the compound bow further including a second inside cable extending adjacent the first inside cable proximate to the tip of the one of the bow limbs, said anchor comprising:

an integral anchor member including a generally planar yoke portion having first and second cable-receiving surfaces, the yoke portion having a first groove extending about a portion of the perimeter of the yoke portion and defining a first cable-receiving surface within which a yoke cable is received, the yoke portion further having a portion of a perimeter opposed to the first cable-receiving surface and defining a second cable-receiving surface against which a first inside cable is receivable, and



a second portion attached to and extending outwardly from one of the planar surfaces of the yoke portion, the second portion defining a third cable-receiving surface configured to have a second inside cable slidingly receivable thereagainst.

4,546,755

CHAIN SAW SEALING DEVICE

Ove Gustavsson, Alsjögatan 25, S-641 51, Katrineholm, Sweden

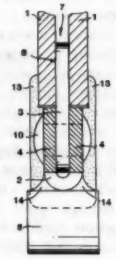
PCT No. PCT/SE83/00043, § 371 Date Sep. 26, 1983, § 102(e) Date Sep. 26, 1983, PCT Pub. No. WO83/02746, PCT Pub. Date Aug. 18, 1983

PCT Filed Feb. 9, 1983, Ser. No. 541,338

Claims priority, application Sweden, Feb. 16, 1982, 8200907

Int. Cl.⁴ B28D *1/08*

U.S. Cl. 125—21 **4 Claims**



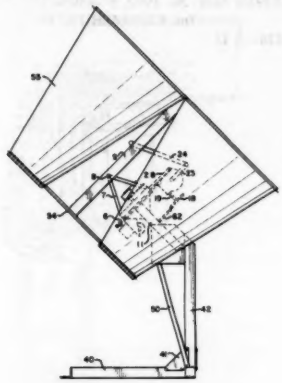
1. In a chain saw useful in sawing through hard materials which includes a motor; a flat saw-bar which includes opposite side faces and a peripheral edge that includes a guide groove extending therein, said flat saw-bar defining an operating plane; and an endless saw-chain which is located around the periphery of said saw-bar and is movable therealong by said motor, said saw-chain including a plurality of interconnected link assemblies, each link assembly including three links which are pivotally connected to one another and which define opposite side faces, at least one of said three links including a cutter element which extends in said operating plane away from said saw-bar and at least one other of said three links including a control lug which extends into said guide groove in the peripheral edge of said saw-bar; the improvement wherein each said link assembly includes a unitary plastic seal means which is firmly attached to at least a portion of each of the opposite side faces of each of said three links thereof, said plastic seal means protecting said links from being damaged by abrasive particles, said unitary plastic seal means including edges which extend over the opposite side faces of said flat saw-bar.

4,546,756

TRACKING SYSTEM

Vernon A. Leroy, Watersmeet, Mich.; Harold D. Gaedtke, and Harold D. Gaedtke, both of Tomahawk, Wis., assignors to G&G Solar, Inc., Wausau, Wis.

Filed Dec. 14, 1981, Ser. No. 330,512
Int. Cl.⁴ J24D *3/00*
U.S. Cl. 126—424 **10 Claims**



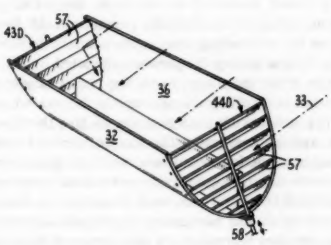
1. A tracking system which comprises, in combination, a fixed support
(a) a rotatable base mounted on said support,
(b) means for rotating said base at a predetermined angular rate,
(c) means responsive to a predetermined rotation of said base to rotate said base in reverse direction to a predetermined variable starting location, and
(d) first means responsive to reverse rotation of said base to alter said predetermined rotation and said predetermined starting location,
wherein said first means includes a cam, means responsive to reverse rotation of said base to alter the position of said cam, path limit determining means for said base and means responsive to said cam to set the path limits of said path limit determining means.

4,546,757

FIXED POSITION CONCENTRATING SOLAR COLLECTOR

Douglas Y. Jakahi, 94-037 Huo Pl., Mililani Town, Hi. 96789

Continuation-in-part of Ser. No. 398,911, Jul. 16, 1982, which is a continuation of Ser. No. 229,512, Jan. 29, 1981, abandoned. This application Nov. 5, 1984, Ser. No. 668,085
Int. Cl.⁴ F24J *3/02*
U.S. Cl. 126—438 **25 Claims**



1. In a solar collector having a reflective trough directing entering rays of the sun onto a heat absorbing element, convertable end structures formed for rendering the trough ends selectively penetrable to the rays of the sun and internally reflective to solar radiation, and control means for said convertable end structures automatically operating said convertable end structures to make the sunward end of said trough penetrable to the rays of the sun and the opposite end of said trough reflect the sun's rays encountering same into said trough.

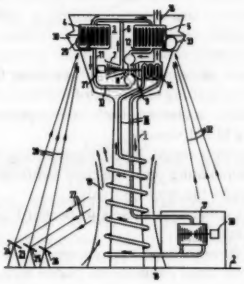
16. A solar energy collector, comprising
a structure providing an open trough having an internal structure defining a compound parabolic curve composed of one half of a parabola joined by a quarter circle to the other half of said parabola shifted 90 degrees,
said internal surface of said trough being reflective to radiation from the sun,
said internal surface being formed to reflect the rays of the sun onto a focal area within said trough,
and means for selectively rendering the sunward end of said trough substantially transparent to solar radiation and the other end internally reflective of solar radiation into said trough.

4,546,758

SOLAR-TOWER POWER STATION

Franck Ebernard, Hannberg, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Continuation of Ser. No. 381,131, May 24, 1982, abandoned, which is a continuation of Ser. No. 182,230, Aug. 28, 1980, abandoned. This application Nov. 5, 1984, Ser. No. 668,684
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1979, 2937529
Int. Cl.⁴ F24J *3/02*
U.S. Cl. 126—451 **14 Claims**



1. Solar-tower power plant comprising a tower having a base and an upper end, an array of mirrors disposed around said base of said tower, a non-reflective cavity-type solar heater being disposed at said upper end of said tower and having a cavity formed therein defining a wall adjacent to said cavity, said cavity wall having a radiation input opening formed therein defining a non-reflective edge of said cavity wall, said solar heater being heatable by radiation reflected and concentrated by said mirror array and received through said radiation input opening, a coolant conduit connected to said solar heater for utilizing radiation heat therefrom, a radiation heat exchanger having tubes and being connected to said coolant conduit, the tubes of said radiation heat exchanger being disposed in a ring around said non-reflective edge of said cavity wall outside said cavity wall facing said mirror array means having a surface area disposed in vicinity of said tubes and facing said cavity wall for influencing heat transfer to said tubes at least by at least one of heat conduction and back radiation, said radiation heat exchanger having a highly temperature resistant glass cover being disposed on the tubes of

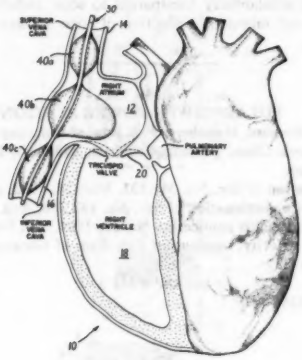
said radiation exchanger for reducing convection losses, said glass cover having expansion gaps formed therein forming segments, and a lateral seal disposed on said glass cover, wherein said glass cover is highly permeable ins the visible radiation range, and including a selective coating disposed on at least part of said glass cover for reducing heat radiation and making said glass cover less permeable in the infra-red heat radiation range.

4,546,759

METHOD AND APPARATUS FOR ASSISTING HUMAN HEART FUNCTION

Mladen Solar, 116-79th St., Brooklyn, N.Y. 11209

Filed Jul. 29, 1983, Ser. No. 518,387
Int. Cl.[4] A61B *19/00*
U.S. Cl. 128—1 D **10 Claims**



1. A method of assisting right ventricle function of the human heart comprising the steps of

simultaneously occluding both the superior and inferior vena cava blood vessels,

while said vessels are occluded, pressurizing the atrial chamber communicating with the right ventricle to urge blood flow through the tricuspid valve,

thereafter opening said vessels to permit blood flow therethrough, and

after blood flow through said vessels has resumed, depressurizing the atrial chamber to enable blood to enter said chamber.

7. An intra-vascular pressurizing apparatus comprising

a dual lumen catheter tube,

three balloon elements mounted on said catheter tube, in longitudinally spaced apart relation, each of said ballon elements capable of being inflated and deflated,

the intermediate balloon element being asymmetrical with respect to said catheter tube when inflated,

means coupling one of the lumens of said catheter tube with the first and third of said balloon elements for supplying an inflating medium to and withdrawing said medium from both said first and third balloon elements simulaneously,

means coupling the other of said lumens to said intermediate balloon element for supplying an inflating medium to and withdrawing said medium from said intermediate balloon element,

individual means for supplying and withdrawing an inflating medium coupled to each of said lumens, respectively, and

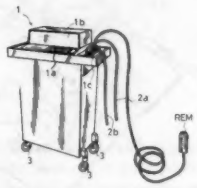
means for controlling the operation of said supplying and withdrawing means in a predetermined sequence.

4,546,760

ARTIFICIAL HEART DRIVING APPARATUS

Akira Suzuki, Nishio; Takeharu Oumi, Tokyo; Sanshiro Takamiya, Nagoya, and Hideo Nakazawa, Saitama, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Mar. 28, 1983, Ser. No. 480,181
Claims priority, application Japan, Mar. 30, 1982, 57-52141; Mar. 30, 1982, 57-52142; Mar. 30, 1982, 57-52143; Mar. 30, 1982, 57-52933; Mar. 30, 1982, 57-45056[U]
Int. Cl.[4] A61B *19/00*
U.S. Cl. 128—1 D **5 Claims**



1. An artificial heart driving apparatus comprising:

a positive pressure source;

a first solenoid valve having an input port connected to an output port of said positive pressure source;

a first accumulator having an inner space connected to an output port of said first solenoid valve;

a second solenoid valve having an input port connected to the inner space of said first accumulator and an output port connected to an artificial heart;

a first pressure detecting means for detecting pressure in a fluid path from the output port of said first solenoid valve to the input port of said second solenoid valve;

a negative pressure source;

a third solenoid valve having an input port connected to an output port of said negative pressure source;

a second accumulator having an inner space connected to an output port of said third solenoid valve;

a fourth solenoid valve having an input port connected to the inner space of said second accumulator and an output port connected to an artificial heart;

a second pressure detecting means for detecting pressure in a fluid path from the output port of said third solenoid valve to the input port of said fourth solenoid valve;

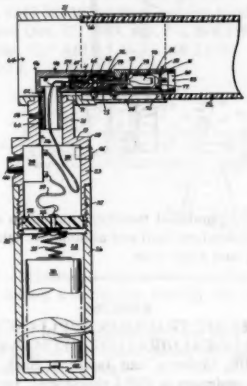
a control board including input means for presetting a positive pressure value, a negative pressure value, an ON/-OFF duty value and a heartbeat value; and

control means for (a) comparing the pressure detected by the first pressure detecting means with the preset positive pressure value, controlling the pressure in the first accumulator by controlling energization of the first solenoid valve, (b) comparing the pressure detected by the second pressure detecting means with the preset negative pressure value controlling the pressure in the second accumulator by controlling energization of the third solenoid valve, and (c) energizing the second solenoid valve and deenergizing the fourth solenoid valve during a first given time interval dependent on the preset heartbeat value and the ON/OFF duty value, and deenergizing the second solenoid valve and energizing the fourth solenoid valve during another second given time interval dependent on the heartbeat value and the ON/OFF duty value, the sum of the first given time interval and the second given time.

4,546,761
LARGE ANIMAL SPECULUM HOLDER AND BATTERY-POWERED ILLUMINATOR

Robert J. McCullough, Barrington, Ill., assignor to McCullough Cartwright Pharmaceutical Corp., Barrington, Ill.

Filed Jan. 12, 1983, Ser. No. 457,434
Int. Cl.[4] A61B *1/06*
U.S. Cl. 128—6 11 Claims



1. A large animal speculum holder and battery-powered illuminator for a tubular speculum comprising:

a handle having a cylindrical case with separate battery and switch compartment housings at opposite end portions thereof;

said switch compartment housing having a bore at one end;

a wall separating said housings for effectively sealing the switch compartment from the battery compartment;

first contact means supported on said wall engageable with a terminal of a battery in said battery compartment;

switch means located in said switch compartment with actuator means externally of the handle;

a speculum support sleeve open at both ends fastened across said switch compartment housing at substantially right angles thereto, the proximal end of said sleeve providing a viewing opening, and the distal end of said sleeve providing a recess for receiving a tubular speculum inserted therein;

a lighting assembly comprising an L-shaped base bulb holder unit and a separable bulb housing unit;

said base bulb holder unit having opposite tubular leg members disposed at substantially right angles to one another, means locking one of said leg members into said bore in the switch compartment housing with the other leg member extending parallel to the support sleeve toward the distal end thereof closely adjacent the wall of said support sleeve, said other leg member having socket means with a second contact therein;

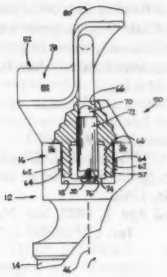
said bulb housing unit comprising a tubular member parallel to the axis of the speculum support sleeve having plug means at one end connectable to said socket means and having a third contact engageable with said second contact in said socket means, a bulb in the opposite end positioned to direct light toward the distal end of a tubular speculum inserted in said sleeve, and means including a lens sealing said bulb within said other leg member; and

an electrical circuit for energizing said bulb in response to actuation of said switch means including conductor means interconnecting said first, second and third contacts with said switch means, and a return path completing the circuit through said lighting assembly and handle to the other terminal of the battery.

4,546,762
LARYNGOSCOPE INCLUDING A LATERALLY OFFSET BLADE

Michael S. Upsher, 2957 Adeline Dr., Burlingame, Calif. 94010

Filed Jun. 6, 1983, Ser. No. 501,538
Int. Cl.[4] A61B *17/24*
U.S. Cl. 128—11 3 Claims



3. A laryngoscope, comprising:

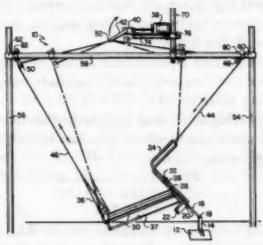
(a) a handle including an elongated, straight hand gripping segment defining an elongation axis and having an uppermost end and a blade connecting head segment extending up from said uppermost end, and

(b) a blade disengagably connected to said handle and including a handle connecting back segment and an elongated front segment extending out from said handle connecting segment, said front segment including laterally adjacent first and second subsegments extending its entire length, said second subsegment being disposed within a single plane extending through the elongation axis of the handle's hand gripping segment and containing a light source associated conduit, said first subsegment being disposed laterally to one side of said plane and serving to elevate the patient's tongue and guide an endotracheal tube into the patient's throat.

4,546,763
CONTINUOUS PASSIVE MOTION METHOD AND APPARATUS

Richard D. Coutts, 4210 Ridgeway, San Diego, Calif. 92116

Continuation-in-part of Ser. No. 319,646, Nov. 9, 1981, abandoned. This application Mar. 1, 1984, Ser. No. 585,299
Int. Cl.[4] A61H *1/00, 1/02*
U.S. Cl. 128—25 R 19 Claims



1. A continuous passive motion recuperative apparatus, said apparatus comprising:

a base member;

an adjustable thigh support member having an inner end and an outer end, said inner end being pivotally attached to

said base member for pivotal movement about said inner end thereof;

a lower leg support member having an inner end and an outer end and pivotally connected at the inner end to the outer end of said thigh support member; and

guide means for guiding the outer end of said lower leg support member; and

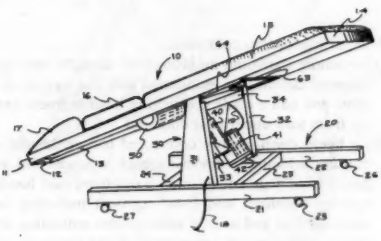
continuous drive means including linkage means comprising an elongated flexible link of adjustable length connected at one end of said thigh support member and at the other end to a continuously moveable drive member for inducing a selected continuous motion thereof for flexing one or more joints of a leg.

4,546,764

POSTURAL DRAINAGE BED

James A. Gerber, Springfield, Oreg., assignor to Invacare Corporation, Elyria, Ohio

Filed Apr. 8, 1983, Ser. No. 483,097
Int. Cl.[4] A61H *1/00*
U.S. Cl. 128—33 **10 Claims**



1. A postural drainage bed comprising:

a base;

a frame;

a bed top, said bed top being positioned on said frame and said frame being pivotally mounted on said base to be selectively tipped relative to horizontal;

means for tilting said frame relative to said base and for holding said frame in a tilted position;

a discrete chest supporting section operatively connected with the frame;

a head supporting section operatively connected with the frame, the head supporting section including a central patient neck receiving portion and a pair of side portions extending more upwardly than the neck receiving portion and the chest supporting section such that the side portions may engage shoulders of a patient lying face down on the bed top when the frame is tipped downward;

a separate lower body supporting section operatively connected with the frame;

means for imparting a percussion action having a therapeutically effective frequency and amplitude only to said chest supporting section; and,

means supporting said chest supporting section which essentially confines and isolates said percussion action to said chest supporting section.

4,546,765

REDUCING MACHINE APPARATUS

Albert E. Adams, 224 Zion Way, Santa Ana, Calif. 92703

Filed Dec. 28, 1983, Ser. No. 566,389
Int. Cl.[4] A61H *23/00*
U.S. Cl. 128—55 **8 Claims**

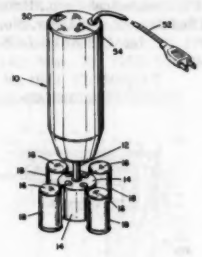
1. A fatty tissue reducing machine comprising:

a driving apparatus,

a rigid cylinder attached to said driving apparatus,

said rigid cylinder by including a plurality of axial slots disposed therein from the periphery of said rigid cylinder toward the center thereof, and

flexible cylindrical members attached to said rigid cylinder,



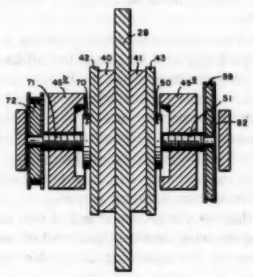
said flexible cylindrical members include a sheet of elastic material folded on itself and attached to said rigid cylinder engaging said axial slots.

4,546,766

THERAPEUTIC TRACTION APPLIANCE HAVING SELF-CALIBRATING MECHANISM

Howard A. Hill, Malvern, and James A. Sack, Downingtown, both of Pa., assignors to Hill Laboratories, Inc., Malvern, Pa.

Filed Mar. 2, 1984, Ser. No. 585,542
Int. Cl.[4] A61F *5/01*; F16D *65/52*
U.S. Cl. 128—71 **9 Claims**



1. In a device for applying a controlled amount of tension to a human body, including frame means, rotary means mounted in said frame means, an arm pivotally mounted in the frame means and adapted to be connected to the human body for applying said tension thereto, means on said arm and rotary means cooperable to rotate said rotary means in response to alternating pivotal movement of said arm, brake means for applying friction to said rotary means, and adjustable means coupled to said brake means for adjusting the magnitude of the friction applied by said brake means, the improvement wherein said brake means includes a pair of brake pads mounted in opposed relation on opposite sides of said rotary means for movement in a path along its rotational axis, caliper block means slidably mounted in said frame adjacent to the periphery of said rotary means for mounting said brake pads, first means coupling one of said brake pads to said caliper block for movement relative thereto, and second means coupling the other of said brake pads to said caliper block for movement relative thereto, calibrating means connected to said second coupling means for normally urging said one brake pad toward said rotary means, and adjusting means connected to said first coupling means for selectively displacing said one brake pad toward and away from said rotary means, said calibrating means being operable automatically when said one brake pad is

displaced away from said rotary means to cause said other brake pad to move toward said rotary means and upon engagement therewith to displace said calibrating block relative to said rotary means and to urge said one brake pad toward said rotary means.

4,546,767

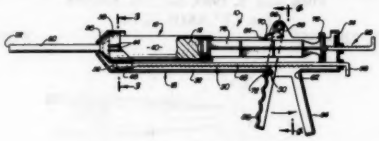
CEMENT INJECTION DEVICE

Carl W. Smith, 1317 W. 162nd St., Gardena, Calif. 90247

Filed Oct. 27, 1983, Ser. No. 546,199

Int. Cl.[4] A61F *5/04;* **A24F** *25/00*

U.S. Cl. 128—92 E **20 Claims**



1. A device for injecting a cement into a cavity, comprising:

a syringe including a barrel for holding the cement and a plunger;

a nozzle attached to and extending from said barrel so that the cement held in said barrel passes through said nozzle for injection into the cavity;

a canister for supporting said syringe which allows said nozzle to extend through and outwardly from said canister;

means for withdrawing said nozzle into said canister while simultaneous y expelling the cement from said barrel through said nozzle for injection into the cavity; and

means for compensating for variations in the volumes of the cavities, said compensating means permitting the movement of said syringe and said nozzle as a unit to maintain a tip of said nozzle at the meniscus of a rising column of the injected cement.

4,546,768

INHALATION APPARATUS FOR ANIMALS

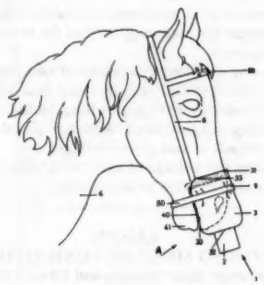
Georg Ferierabend, Steinrain 25, Aarburg, Switzerland

Filed Dec. 14, 1982, Ser. No. 449,795

Claims priority, application Switzerland, Dec. 22, 1981, 8188/81

Int. Cl.[4] A61M *11/00, 15/00*

U.S. Cl. 128—200.16 **9 Claims**



1. In an inhalation apparatus for an animal which includes a mask having means for facilitating inhalation and exhalation by an animal wearing said mask, and means for supplying to said mask a gaseous inhalation medium, the improvement comprising wherein said mask includes a bag which is open at an upper end thereof and has a cavity which communicates with said open upper end and is adapted to receive the nose of the animal, said open upper end of said bag terminating in a generally semi-cylindrical wall part and a flattened wall part extending across the concave side of said semi-cylindrical wall part, said semi-cylindrical wall part and said flattened wall part of said bag each terminating in an upper edge, said upper edges defining said open upper end of said bag, and wherein said mask includes an adjustable belt which extends around said bag, said belt having a first portion which is adjacent said semi-cylindrical wall part of said bag and a second portion which is spaced outwardly from said flattened wall part, said belt being spaced below said upper edge of said flattened wall part, whereby said flattened wall part can be placed in the mouth of the animal so that said bag receives the nose of the animal and the space between said second portion of said belt and said flattened wall part receives the lower jaw of the animal, and said adjustable belt can then be tightened until the animal is prevented from opening its mouth and must breathe through its nostrils.

4,546,769

SUTURE THREAD

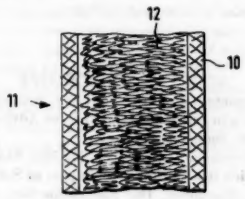
Heinrich Planck, Nurtingen, and Wolfgang Joas, Reutlingen, both of Fed. Rep. of Germany, assignors to Institute fur Textilund Faserforschung, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 291,052, Aug. 7, 1981, abandoned. This application Feb. 14, 1984, Ser. No. 579,964

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1980, 3030972

Int. Cl.[4] A61L *17/00*

U.S. Cl. 128—335.5 **27 Claims**



1. A suture thread which comprises a jacket of a tubular braided structure made of yarns which are not crimped, said jacket having been produced by braiding around a core made of fibers, and said core located within the jacket containing crimped fibers; said jacket having a tubular braided structure braided from a number of multi-filament braid yarns taken from braider bobbins, the number of multifilament yarns used during the braiding of the jacket being greater as compared with conventional suture threads of the same diameter range (USP size) and the number of braids per unit length being smaller as compared with said conventional suture threads.

4,546,770

PULMONARY MONITOR

Joseph E. Schlessinger, Berkeley, and Richard G. Hamilton, San Francisco, both of Calif., assignors to Critikon, Tampa, Fla.

Division of Ser. No. 82,898, Oct. 9, 1979, Pat. No. 4,413,632. This application Mar. 4, 1983, Ser. No. 472,415

Int. Cl.[4] A61B *5/00*

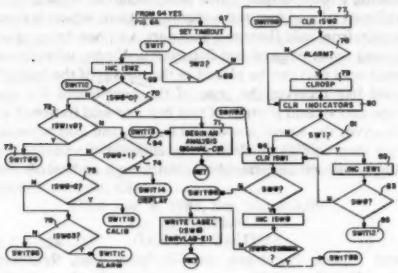
U.S. Cl. 128—630 **2 Claims**

1. A monitor for the measurement, analysis and display of physiological data derived from a patient comprising:

(a) a first transducer for measuring physiological data selected from the group consisting of pressure, temperature, gas concentration, cation and ion concentration, pH, capacitance, displacement, motion, force and flow transducers;

(b) an analyzer having means for calculating selected physiological characteristics of a patient from said transducer

physiological data; and alarm means; and means for displaying said measured physiological data and calculated physiological characteristics; and a manually operated hierarchical selection means for controlling the operation of said calculating and displaying means; and means for calibrating said analyzer in order to substantially eliminate measurement errors; and means to communicate threshold



physiological characteristics; and means for comparing said calculated physiological characteristics against said threshold physiological characteristics and activating said alarm means when said threshold physiological characteristics are not satisfied; and

(c) means for communicating said transducer measured physiological data to said analyzer.

4,546,771

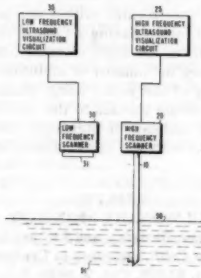
ACOUSTIC MICROSCOPE

Reginald C. Eggleton, and Francis J. Fry, both of Indianapolis, Ind., assignors to Indianapolis Center for Advanced Research, Inc. (ICFAR), Indianapolis, Ind.

Continuation-in-part of Ser. No. 354,708, Mar. 4, 1982, abandoned, which is a continuation-in-part of Ser. No. 114,705, Jan. 23, 1980, abandoned. This application Sep. 14, 1983, Ser. No. 531,917

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—660 **20 Claims**



1. An ultrasound visualization system comprising:

(a) a needle, said needle having a sharp point at one end and being adapted for insertion into the human body;

(b) high frequency ultrasound transducer means for producing and receiving acoustical beams of at least 100 MHz frequency from within said needle;

(c) beam directing means for directing acoustical beams produced by said transducer means radially from said needle at a point outside of said needle;

(d) scan means coupled to said transducer means for scanning acoustical beams produced by said high frequency ultrasound transducer and directed by said beam directing means; and

(e) visualization circuitry means for translating acoustical beams received by said transducer means into a visual display.

4,546,772

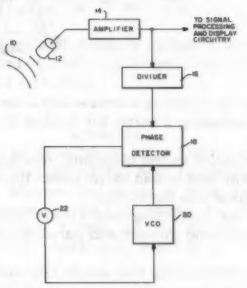
METHOD AND MEANS FOR DETERMINING ULTRASONIC WAVE ATTENUATION IN TISSUE USING PHASE LOCKED LOOP

Stephen W. Flax, Waukesha, Wis., assignor to General Electric Company, Milwaukee, Wis.

Filed Aug. 8, 1983, Ser. No. 520,958

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—660 **3 Claims**



1. In an ultrasound imaging obtaining system, a method of a measure of attenuation of an ultrasonic wave comprising the steps of

(a) providing transducer means for receiving reflected ultrasonic waves and generating an electrical signal in response thereto,

(b) providing a phase detector having a first input terminal for receiving a first signal and a second input terminal for receiving a second signal and an output terminal, said phase detector generating an output signal on said output terminal which is indicative of the phase difference between said first and second signals,

(c) connecting said electrical signal to said first input terminal,

(d) providing a voltage controlled oscillator having an output terminal for a generated oscillation signal and a control terminal for receiving a signal for controlling oscillation frequency,

(e) connecting said output terminal of said phase detector to said control terminal and applying said output signal of said phase detector for controlling oscillation frequency,

(f) connecting said generated oscillation signal to said second input terminal of said phase detector and,

(g) measuring the voltage of said output signal of said phase detector as indicative of attenuation.

4,546,773

APPARATUS TO MEASURE CONICAL THICKNESS

Frederic B. Kremer, Bala Cynwyd, and Edward R. O'Brien, III, Wayne, both of Pa., assignors to Accutome, Inc., Frazer, Pa.

Continuation of Ser. No. 227,753, Jan. 23, 1981, abandoned. This application May 7, 1984, Ser. No. 607,603

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—660 **5 Claims**

1. Apparatus for measuring the thickness of a cornea having an anterior surface and a posterior surface comprising

means for directing pulses of ultrasonic energy toward the said cornea surfaces to create a first reflected pulse from

the anterior cornea surface and a second reflected pulse from the posterior cornea surface;

time window means for receiving the first and second reflected pulses only if they arrive within a predetermined expected time interval;

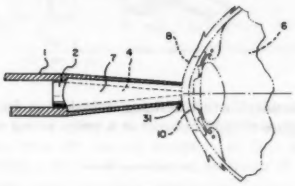
means for measuring the time interval between the first and second reflected pulses,

the means for measuring comprising means to convert the pulses to a gate pulse and means to stretch the gate pulse,

the means to stretch the gate pulse comprising

means for integrating the gate pulses, said means for integrating comprising an input and an output,

comparator means having an input and an output, said



comparator means being connected to the output of said means for integrating, and

means for controlling the operation of said means for integrating, said controlling means being itself controlled by the output of said comparator means;

means for inhibiting the measurement of time intervals before the first reflected pulse which do not arrive within the said predetermined expected time interval and after the second reflected pulse which do not arrive within the said predetermined expected time interval; and

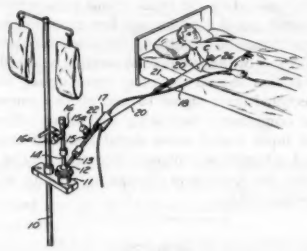
means for converting the time interval between the first and second reflected pulses into an equivalent measured distance.

4,546,774

LEVELING DEVICE FOR HEMODYNAMIC MONITORING TRANSDUCER ASSEMBLY

Robert M. Haught, 1800 NW. 4th Ave., Apt. #15A, Boca Raton, Fla. 33432

Filed Feb. 24, 1983, Ser. No. 469,465
Int. Cl.⁴ A61B *5/02*
U.S. Cl. 128—673 **6 Claims**



1. In combination with a vertically adjustable hemodynamic monitoring transducer assembly, a leveling device comprising:

an elongated flexible line adapted to extend substantially taut between said transducer assembly and the chest of a patient whose heart is to be monitored;

attachment means on one end of said line releasably attaching it to the transducer assembly;

attachment means on an opposite end of said line for attaching it to the patient's chest at the level of the right atrium of the heart;

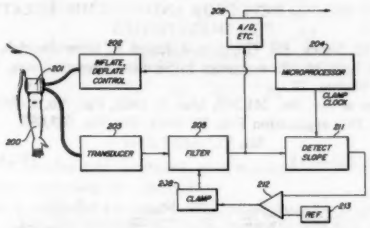
and a small bubble level on said line between its ends to indicate whether it is horizontal.

4,546,775

DETECTION OF BLOOD PRESSURE COMPLEXES IN AUTOMATED VITAL SIGNS MONITORS

Richard Medero, Lutz, Fla., assignor to Critikon, Inc., Tampa, Fla.

Filed Jun. 18, 1984, Ser. No. 621,647
Int. Cl.⁴ A61B *5/02*
U.S. Cl. 128—681 **7 Claims**



1. An oscillometric blood pressure monitor comprising:

(a) means for sensing arterial pressure pulsations;

(b) transducer means, responsive to said means for sensing, for producing signals representative of said pulsations;

(c) means, responsive to said transducer means, for filtering said signals to pass at least signals of a frequency band corresponding to oscillatory complexes;

(d) means for selectively clamping the output of said means for filtering to a predetermined baseline; and

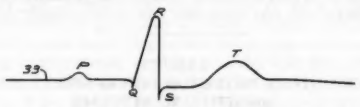
(e) control means, responsive to the slope of said signals from said means for filtering, for enabling said means for clamping.

4,546,776

PORTABLE EKG MONITORING DEVICE FOR ST DEVIATION

Howard T. Bellin, 240 E. 47th St., New York, N.Y. 10017; Donald Fellner, 6 E. 74th St., New York, N.Y. 10028, and Nichan Tchorbajian, 96-10 23rd Ave., Elmhurst, N.Y. 11373

Filed Sep. 13, 1984, Ser. No. 650,108
Int. Cl.⁴ A61B *5/04*
U.S. Cl. 128—704 **6 Claims**



1. A cardiac monitoring unit comprising sensing means adapted to be attached to the body of an individual to produce an analog representation of the individual's electrocardiogram waveform; means coupled to said sensing means for establishing and storing an ST deviation signal corresponding to the ST deviation of said electrocardiogram waveform; said ST deviation signal establishing means comprising means for locating the QR portion of the waveform, means for sampling a first portion of the waveform at a predetermined period prior to the Q portion of the waveform, means for measuring the slope of the waveform at the sampled points in said first portion, means for determining a first voltage of the waveform at which the measured slope is nearest to zero, means for sampling a second portion of the waveform at a predetermined period subsequent

to the S portion of the waveform, means for measuring the slope of the waveform at the sampled points in said second portion, means for determining a second voltage of said second portion of the waveform at which the measured slope is nearest to zero, and means for determining the ST deviation signal as the difference between said first and second voltages; means for thereafter continuously monitoring the ST deviation signal of said electrocardiogram waveform and for comparing the monitored ST deviation signal with the stored normal ST deviation signal; and means for activating an alarm when the monitored ST deviation signal bears a predetermined relation to the stored normal ST deviation signal.

4,546,777

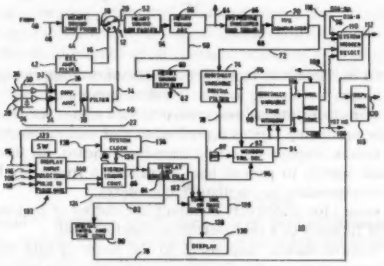
HEART SOUND DETECTOR AND SYNCHRONIZATION FOR DIAGNOSTICS

Mark W. Groch, Elk Grove, and James R. Domnanovich, Roselle, both of Ill., assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.

Division of Ser. No. 241,388, Mar. 6, 1981, Pat. No. 4,496,873. This application Feb. 23, 1984, Ser. No. 583,083

Int. Cl.[4] A61B *5/02*

U.S. Cl. 128—715 **15 Claims**



1. A method of controlling diagnostic apparatus to acquire cardiac or heart function data or images comprising the steps of:

detecting the occurence of a first heart sound and a second heart sound when both are coincident with a prescribed heart sound enable window adjustable within prescribed limits and beginning with the occurence of the first heart sound;

providing an accurately timed systole trigger signal coincident with systole heart function as derived from the heart sound signal; and

controlling data acquistion of diagnostic apparatus in accordance with said accurately time systole trigger signal.

4,546,778

MOISTURE DETECTOR FOR RESPIRATORY MONITORING SYSTEMS

Richard E. Sullivan, Berkeley, Calif., assignor to Critikon, Inc., Tampa, Fla.

Filed May 26, 1983, Ser. No. 498,424

Int. Cl.[4] A61B *5/08*

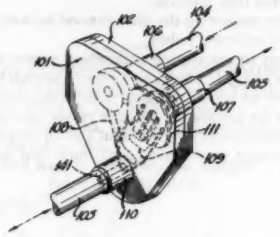
U.S. Cl. 128—718 **4 Claims**

1. In a respiratory gas analysis system, a trap for avoiding unwanted fluid accumulation comprising:

(a) a housing having a generally vertical orientation, having an entry port on one side at a relatively lower extremity, and having an exhaust port on an opposite side at a relatively upper extremity:

(b) said housing defining therein a generally vertical channel having walls extending from below said entry port at least up to said exhaust port, said channel having relatively minimal cross sectional dimension between said opposite sides:

(c) a pair of conductive traces each applied to a wall of said channel, one trace being located at a lower part of said channel, and the other trace having a predetermined location below said one trace on said entry port of said channel:



(d) said housing further defining a flush port for coupling purge gases to said channel at a point above said other trace.

4,546,779

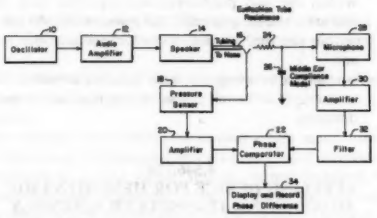
METHOD OF MEASUREMENT OF EUSTACHIAN TUBE OPENING AND ASSOCIATED APPARATUS

Frank Meno, Pittsburgh, Pa., assignor to University of Pittsburgh, Pittsburgh, Pa.

Filed Dec. 12, 1983, Ser. No. 560,143

Int. Cl.[4] A61B *5/12*

U.S. Cl. 128—746 **11 Claims**



1. A method for determining the opening or changes in the opening with time of the Eustachian tube of a subject comprising applying an input sound wave signal to the nasal cavity of the subject, converting the input sound wave signal to a first electrical input signal, feeding said first electrical input signal to a phase comparator, picking up a related output sound wave signal at the ear of the subject, converting said output sound wave signal to a second electrical input signal, feeding said second electrical input signal to said phase comparator, and said phase comparator indicating the phase differential between said input sound wave signal and said output sound wave signal, whereby said phase differential may be employed to determine the opening or change in opening with time of said Eustachian tube.

4,546,780

APPARATUS FOR AIR DRYING TOBACCO LEAVES

Takao Akutsu, and Kiyomi Sato, both of 1-31, Kurobegaoka, Hiratsuka-shi, 254, Japan

Filed Sep. 28, 1983, Ser. No. 536,499

Claims priority, application Japan, Oct. 25, 1982, 57-185953

Int. Cl.[4] A24B *3/10*

U.S. Cl. 131—304 **6 Claims**

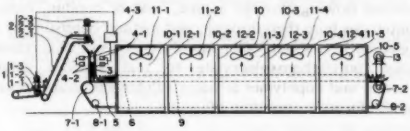
1. An apparatus for air drying tobacco leaves comprising:

a tobacco leaf supply conveyor having a discharge end;

a vertical hopper disposed beneath said discharge end;

an air-permeable conveyor extending substantially from beneath said vertical hopper and running horizontally in a predetermined direction, said air-permeable conveyor being subjected to vertical air flows;

a guide section provided between said vertical hopper and said air permeable conveyor, said guide section including a first pair of vertical walls extending transversely with respect to the air-permeable conveyor and a second pair of



vertical walls extending parallelly with the air-permeable conveyor to define a vertical chamber receiving tobacco leaves from the vertical hopper, said first pair of walls including a first wall positioned upstream of said vertical chamber and extending substantially down to the air-permeable conveyor and a second wall positioned downstream of said vertical chamber and spaced apart from the air-permeable conveyor to form an outlet portion; and

a drying chamber provided to cover said air-permeable conveyor at an intermediate portion thereof.

4,546,781

PERMANENT WAVE CURLER

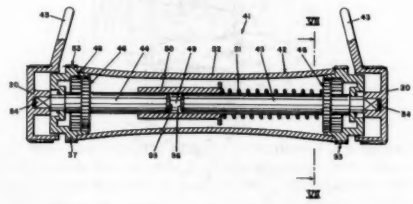
Wolfgang Schmitz, Aachener Strasse 609, 5000 Köln 41, Fed. Rep. of Germany

Filed Nov. 7, 1983, Ser. No. 549,559

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1982, 3244408

Int. Cl.⁴ A45D *2/00*

U.S. Cl. 132—31 R **15 Claims**



1. Permanent wave curler with a roller sleeve onto which a lock of hair can be rolled up and which, after the lock of hair has been rolled up, can be fixed with respect to the latter said curler comprising:

stopping levers affixed, at both ends of the roller sleeve, to a spindle extending through, and being rotably mounted in, said sleeve, each of said levers extending approximately radially with respect to the sleeve axis and being normally non-rotatably coupled to said sleeve at least in the direction in which the lock of hair is unwound, said spindle and said sleeve carrying means for uncoupling said stopping levers from said roller sleeve, said uncoupling means being actuated by moving at least one of said levers in a direction toward, and normal to the longitudinal axis of, said sleeve.

4,546,782

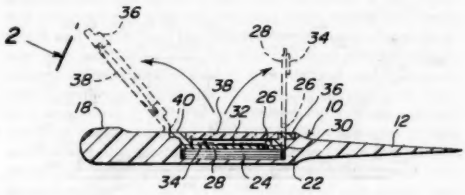
COMBINATION TOOTHPICK, GUM MASSAGER, AND DENTAL FLOSS HOLDER

Carl J. Kucher, 111-33 123rd St., South Ozone Park, N.Y. 11420

Filed Jul. 9, 1984, Ser. No. 629,272

Int. Cl.⁴ A61C *15/00*

U.S. Cl. 132—91 **3 Claims**



1. A combination toothpick, gum massager and dental floss holder comprising in combination:

(a) a combined toothpick and gum massager comprising a main body portion, a short extension protruding radially outward from one edge of said main body portion, a hook-like extension protruding directly radially outwardly from the edge of said main body portion, circumferentially spaced from said short extension, a point extension protruding directly radially outwardly from the edge of said main body portion intermediate said short extension and said hook extension, said short extension including an outwardly facing thin edge for removing particles of food and foreign matter from between or around the incisor, canine, and premolar upper and lower teeth, said hook extension including an outwardly facing thin edge for removing food and foreign matter from between or around the upper and lower inside portions of all the teeth, and said point extension comprising a fine pick for removing food particles and foreign matter from between and around the upper and lower molars and wherein said hook extension further comprises an arcuate bulbous element for massaging the gums;

(b) means for useably storing a quantity of dental floss comprising a centrally located dental floss container recessed into said main body portion whereby dental floss may be directly placed into said dental floss container; a floss storage cover with an aperture through which dental floss may pass, wherein, said floss storage cover is hinged to said main body portion by a resilient integral hinge, a snap lock for said floss storage cover comprising a male portion and mating female portion, whereby said floss storage cover is locked and the spool and loosely gathered dental floss is protectively stored in the space provided for the spool and loosely gathered dental floss;

(c) means for cutting said dental floss to a desired length, comprising a floss cutting blade located on the top surface of said floss storage cover;

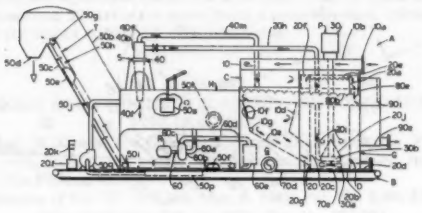
(d) means for protecting the free exposed end of said dental floss, comprising a top cover with bezel and lens which is hinged to said main body portion by a resilient hinge, and, a snap lock for said top cover with bezel and lens comprising a male portion and a mating female portion, whereby when said top cover with bezel and lens is locked said free end of said dental floss is protectively stored in the space between said floss storage cover and said top cover with bezel and lens, and

(e) means associated with said top cover for providing advertising space whereby the advertisement can be viewed through the top cover.

4,546,783
APPARATUS FOR WASHING DRILL CUTTINGS

W. Gerald Lott, Houston, Tex., assignor to Flo Trend Shares, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 490,671, May 2, 1983, abandoned. This application Sep. 27, 1983, Ser. No. 536,942
Int. Cl.[4] B01D *21/10*
U.S. Cl. 134—109 29 Claims



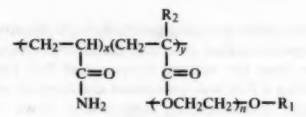
1. An apparatus for cleansing a stream of drilling fluid fouled drill cuttings with a cleaning fluid comprising:
a unitary base;
a housing, said housing having a plurality of chambers, said chambers adapted to retain liquid;
an initial charge of cleansing fluid in said housing;
an inlet chamber; said inlet chamber further formed of a substantially frusto-conical housing having:
a fluid inlet port wherein drilling fluid fouled drill cuttings may be admitted to the apparatus;
a first segment, said fluid inlet port connected to said first segment; and
an oulet segment connected to said first segment, said first segment having nozzles therein to direct into said outlet segment a cleansing fluid;
a first decanting chamber formed of a substantially cylindrical housing having an open top, said first decanting chamber connected to said outlet segment of said inlet chamber; said first decanting chamber separating said fouled drill cuttings into heavy solids in substantially a cleansing solution and lighter solids in substantially drilling fluid;
a solids concentrating assembly, said solids concentrating assembly being in fluid communication with said first decanting chamber, said solids concentrating assembly formed having an overhead outlet, said solids concentrating assembly formed having a bottom outlet, and said solids concentrating assembly formed having an inlet;
a pumping means in fluid communication with the lower end of said first decanting chamber for transporting fluid containing drill cuttings from near the bottom of said first decanting chamber to said inlet of said solids concentrating assembly;
a second decanting chamber formed of a substantially rectangular housing having an open top said first decanting chamber and said inlet chamber being substantially nested within said second decanting chamber;
a concentrating assembly bottoms chamber, said bottoms chamber disposed below said solids concentrating assembly and in flow communication with said bottoms outlet of said concentrating assembly and having a horizontally disposed bottom;
removal means for removing accumulated drill cuttings near the bottom of said concentrating assembly bottoms chamber from the apparatus;
means for recirculating the remaining fluid in said concentrating assembly bottoms chamber to said second decanting chamber and said inlet chamber;
a drain trough assembly, said drain trough assembly mounted near the top of said first and second decanting chambers and disposed to receive decanted drilling fluid from said open tops of said first and second decanting chambers and conduct the drilling fluid accumulated therein from the apparatus.

4,546,784
DRAG REDUCTION AGENT

Donald N. Schulz, Annandale; Ralph M. Kowalik; Jan Bock, both of Bridgewater, and John J. Maurer, New Providence, all of N.J., assignors to Exxon Research and Enginering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 454,468, Dec. 29, 1982, abandoned. This application Jun. 29, 1984, Ser. No. 626,020
Int. Cl.[4] C08F *220/20;* F17D *1/16*
U.S. Cl. 137—13 3 Claims

1. A method for reducing the frictional drag of an aqueous solution flowing through a pipe, hose or conduit, having a continuous bore therethrough, said method consisting of adding about 10 to about 2000 ppms of a copolymer of acrylamide-/alkyl poly(etheroxy)acrylate to said aqueous solution, wherein said copolymer is water soluble and said copolymer has the formula consisting of:

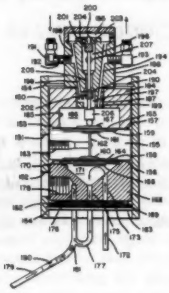


wherein R_1 is selected from the group consisting of C_1 to C_{20} alkyl groups, C_6 to C_{20} aryl groups and C_6 to C_{30} alkylaryl groups, R_2 is hydrogen or methyl group, n is about 8 to 45, y is about 0.01 to about 5.00 mole %, and x is about 95.00 to about 99.99 mole %.

4,546,785
PRESSURE TRANSLATOR AND SYSTEM FOR MEASURING PRESSURE

Dorsey W. Sanderford, Houston, Tex., assignor to Cybar Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 310,274, Oct. 9, 1981, abandoned. This application Oct. 7, 1982, Ser. No. 433,408
Int. Cl.[4] G05D *16/00*
U.S. Cl. 137—85 35 Claims



1. A pressure translator employing a test gas for use in a system for measuring the pressure of a process fluid by a pressure measuring device, said pressure translator comprising:
a main body portion having a hollow interior;
balancing means positioned within said interior to divide said interior into first and second chambers, said means operative under pressure differentials existing between said first and second chambers for increasing the volume of the chamber under higher pressure and simultaneously decreasing the volume of the chamber under lower pressure;
means for placing the process fluid in fluid communication with said first chamber;

means for placing said pressure measuring device in fluid communication with said second chamber; and

valve means interposed between the source of said test gas and said second chamber, said test gas being introduced into said second chamber, said valve means continuously operative in response to said balancing means for controlling introduction of said test gas into said second chamber and for venting said test gas external of said second chamber, said valve means including

an elongated valve cavity,

an elongated valve stem movably mounted in said cavity,

a first valve seat defined within said cavity at one end of said cavity,

a second valve seat defined within said cavity at the other end of said cavity,

a first valve head carried on said valve stem and associated with said first valve seat,

a second valve head carried on said valve stem and associated with said second valve seat, means for continuously introducing said test gas into said valve means at a substantially constant rate,

means for splitting said test gas into first and second gas flows,

means for introducing said first gas flow into one end of said valve cavity, and

means for introducing said second gas flow into the other end of said valve cavity and into said second chamber, said first gas flow urging said value stem toward said balancing means while said second gas flow simultaneously urges said valve stem away from said balancing means in order to maintain a balanced flow through said first and second valve seats and to create an air bearing between said valve stem and said valve cavity.

4,546,786

FLOW CONTROL VALVE

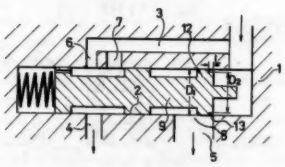
Ichiro Koike, Higashimatsuyama, Japan, assignor to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1983, Ser. No. 475,984

Claims priority, application Japan, Mar. 26, 1982, 57-43018[U]

Int. Cl.⁴ G05D *11/03*

U.S. Cl. 137—117 **1 Claim**



1. A flow control valve adapted to be placed in a hydraulic fluid flow path that extends from the discharge port of an oil pump to a load device that is operable by the hydraulic fluid, and including a return path connecting the hydraulic fluid flow path with a tank associated with said oil pump so that hydraulic fluid can be returned to said tank, said flow control valve comprising: a housing having an elongated cylindrical valve bore therein, an inlet passage adapted to be connected to said discharge port of said oil pump for receiving hydraulic fluid therefrom, a first adjustable orifice connecting said valve bore with said inlet passage so that hydraulic fluid can be supplied to said bore, a load port extending from said valve bore and providing a discharge path which is adapted to be connected to said load device so that the hydraulic fluid can be supplied to said load device through said first orifice and valve bore and load port, a return port extending from said valve bore and adapted to be connected to said return path, said inlet passage communicating with one end of said valve bore to a location close to said return port and remote from said first orifice; a valve spool disposed in said valve bore for longitudinal sliding movement therein, said valve spool having a first cylindrical land adapted to move across and adjust the effective size of said first orifice and having a second cylindrical land adapted to move across and adjust the effective size of said return port, said valve spool being movable in said valve bore in response to a pressure difference across said first orifice between a first position in which said second land blocks said return port from said inlet passage and said first land is out of blocking relationship with said first orifice so that said first orifice is fully open and communicates with said load port, and a second position in which said second land places said inlet passage in communication with said return port and said first land partially blocks communication between said first orifice and said load port, said second land of said valve spool having an edge in the form of a concentric cylindrical end portion of uniform reduced diameter smaller than the diameter of the remainder of said second land and the diameter of said bore, said end portion projecting longitudinally in said bore and toward said inlet passage and being joined to the remainder of said second land by an outwardly projecting shoulder so that said end portion defines an annular notch of uniform width that opens toward said inlet passage, the zone between the longitudinal wall of said end portion and the opposing edge of said return port defining an elongated variable orifice for controlling the rate of flow of the hydraulic fluid from said inlet passage to said return path, said first and second lands being relatively positioned so that said variable orifice begins to unblock said blocked return port of said return path, and hence start it to gradually open to communication with said valve bore as said first adjustable orifice begins to close when said valve spool is moving from said first to said second position and, as said variable orifice begins to open, said end portion is located to maintain the pressure that acts to move said valve spool until said end portion has moved past the opposing edge of said return port, said end portion having an axial length L in the range of about 0.5 mm to 3.0 mm, the radial thickness $(D_1-D_2)\div 2$ of said elongated variable orifice being in a range from no less than 0.1 mm up to at least 0.25 mm, where D_1 is the diameter of the second land and D_2 is the diameter of said uniform reduced diameter end portion.

4,546,787

HYDRAULIC VALVE CONTROL DEVICE

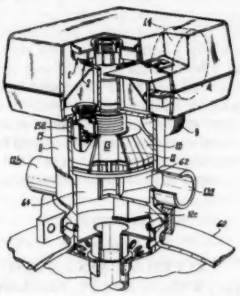
Graham J. Meyers, Frankston; Barry L. Hudson, Lower Templestowe, and Desmond J. Berry, Mt. Eliza, all of Australia, assignors to Clark Rubber Limited, Clayton, Australia

Filed Jun. 21, 1982, Ser. No. 390,546

Claims priority, application Australia, Jun. 22, 1981, PE9380/81

Int. Cl.⁴ F16K *21/00*

U.S. Cl. 137—119 **21 Claims**



1. A motor-operable fluid valve for a pump, said valve comprising a valve body defining an open central portion,

means defining at least one high pressure inlet port in fluid communication with the open central portion, means defining a plurality of lower pressure inlet and/or outlet ports in fluid communication with the open central portion via an array of individual flow passages and a valve rotor means comprising a rotor having means defining a plurality of openings and disposed for movement in both rotation and translation within the open central portion in the line of flow from the high pressure to the lower pressure ports and a centrally mounted shaft operable to rotate and translate the rotor selectively, relative to the axis of the shaft, to connect selected inlet and outlet ports; said valve further comprising a rotational means carried on the shaft of the valve rotor; wherein the rotational means cooperates with a drive gear and in that the drive gear includes a top face and a bottom face, of which the top face is sloped so as to form a cam surface against which a bottom face of the rotational means acts as a cam follower, such that when the drive gear is rotated the rotational means and hence the valve rotor are raised and lowered by the camming action.

4,546,788

SLIDE VALVE CONSTRUCTION

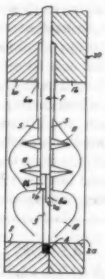
Hans Stalder, and Hans Sidler, both of Eschenbach, Switzerland, assignors to Sistag, Maschinenfabrik Sidler AG, Switzerland

Filed Apr. 16, 1982, Ser. No. 369,233

Claims priority, application Switzerland, Oct. 29, 1981, 6908/81

Int. Cl.⁴ F16K *3/30*

U.S. Cl. 137—242 **6 Claims**



1. A slide valve comprising a valve housing having a through passage with a curved bottom and a valve guideway on each side of said bottom, a valve member mounted for reciprocable movement in said housing including a slide valve plate movable across the passage to close the passage, flange means in said housing disposed along sides of said plate and having at least one notch portion defining a scraper edge adjacent said valve plate, said valve plate having a lower step portion followed by a bottom projecting portion, said bottom portion having a bottom surface, said step portion having an upper surface spaced upwardly from said bottom surface and said bottom portion having an intermediate surface between said bottom and upper surfaces, said upper surface being curved downwardly at each side toward said bottom surface to define a shearing edge on each side of said valve plate cooperable with said scraper edge to dislodge material away from said slide valve plate.

4,546,789

VALVED ACCESS FITTING

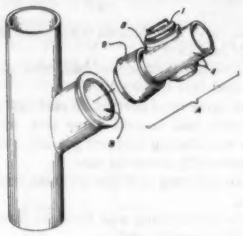
Robert R. Taylor, 6 Mount Airy Pl., Morristown, N.J. 07960

Filed Mar. 31, 1983, Ser. No. 480,741

Int. Cl.⁴ B08B *9/06*

U.S. Cl. 137—245.5 **9 Claims**

1. A removable valved access fitting comprising a valve body with a large, straight bore and a valve housing having inlet and outlet ports which ports substantially align with said bore when said body is in an open position, said housing being adapted for connection to a sewer line through said outlet port, said fitting adapted with an inlet port open to the environment to permit passage of a mechanical sewer cleaning apparatus through said inlet port, valve bore, and said outlet port, a removable sealable collar means adapted to be fitted on a neck of said outlet port, said collar means being wedgeable within said sewer line to retain said fitting therein, thereby said collar means being easily insertable and removable on said outlet port



to prevent seizing between said sewer line and said fitting often caused by corrosion and so that a sewer blockage can be removed without the removal of said fitting from said sewer line, said inlet port adapted to receive a removable hollow connector; and a flexible hose having an inside diameter substantially the same as that of said valve bore, a connector end adapted for removable, sealable attachment to said inlet port and adapted to permit passage of said mechanical cleaning device through said flexible hole, said inlet port, said valve bore, said outlet port and into said sewer line for removal of sewer line blockage.

4,546,790

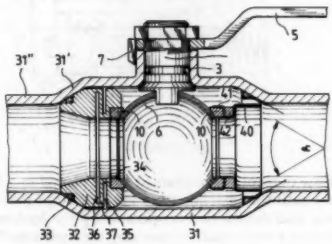
FLUID VALVE

Richard Huber, Vienna, Austria, and Peter Wirz, Unterkulm, Switzerland, assignors to Klinger AG, Zug, Switzerland

Filed Apr. 7, 1983, Ser. No. 482,837

Int. Cl.⁴ F16K *5/06*

U.S. Cl. 137—315 **8 Claims**



1. A fluid valve, comprising a housing having
a first tubular end portion,
a tubular central portion of increased diameter,
a first trunconcial intermediate portion joining said first end portion to said central portion of increased diameter, and
a second tubular end portion,
a second trunconical portion joining said central portion to said second tubular end portion, the housing being of unwelded integral construction, and said trunconical portions having cone angles of at least 30°, and
a valve system means disposed in said central housing portion and comprising at least one valve body,

a support means, sealing means, and at least one tolerance absorbing means subject to variable compression

whereby said valve system is axially clamped with said tolerance absorbing means under varying compression between said trunconical portions and is operative regardless of production tolerances affecting axial clearance between said trunconical portions,

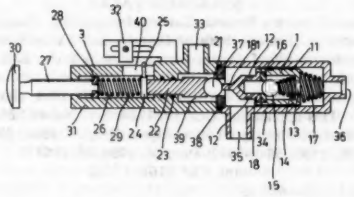
said tolerance absorbing means being plastically deformable and disposed between said trunconical intermediate portions and said valve system, and said deformable means being deformable by assembling forces but non-deformable by valve actuating forces.

4,546,791

SAFETY VALVE

E-Jen Huang, No. 449, Ching Chuo Rd., Chi Feng Village, Wu Feng Hsiang, Taichung Hsien, Taiwan

Filed Mar. 20, 1984, Ser. No. 591,239
Int. Cl.⁴ F16K *17/06*
U.S. Cl. 137—512 **1 Claim**



1. An improved safety valve for feeding water machine, comprising:

a first casing having an inlet and outlet;

a spring-loaded sliding member slidably mounted into said first casing, said spring-loaded sliding member having a hole communicating with said outlet;

a spring-loaded steel ball mounted into said spring-loaded sliding member;

a ring mounted into said sliding member so as to confine said spring-loaded steel ball into said sliding member;

a supporting member abutting against said ring, said supporting member having an elongated portion and two holes communicating with said inlet;

a second casing fixedly attached to said first casing, said second casing having a first chamber, a second chamber and an outlet communicating with said second chamber;

a stem threadedly engaged with said second casing in such a way that said stem may be screwed into or out of the first chamber of said second casing;

a push member mounted into said second casing and fastened to the end of said stem;

a spring located against said push member at one end and provided with a spring shoe at the other end, said spring shoe having a protuberance extending out of said second casing;

a sliding rod disposed against said spring shoe and contacting a second steel ball at the other end; and

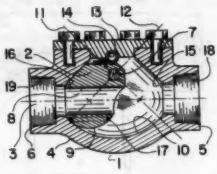
a spacer mounted between said first casing and said second casing, said spacer having a center hole through which the elongated portion of said supporting member extends to contact said second steel ball.

4,546,792

BALL-PLUG PENDULUM CHECK VALVE

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005, and Michael Stranahan, P.O. Box 15, Woody Creek, Colo. 81656

Continuation-in-part of Ser. No. 372,462, Apr. 28, 1982. This application Dec. 19, 1983, Ser. No. 562,840
Int. Cl.⁴ F16K *15/03*
U.S. Cl. 137—527 **8 Claims**



1. A ball-plug pendulum check valve comprising in combination:

(a) a ball-plug of a circular cylindrical geometry having a substantially hemispherical end, said ball-plug including a through-hole with central axis substantially passing through the center of a spherical surface including said hemispherical end of said ball-plug and intersecting with the central axis of said ball-plug in an oblique angle;

(b) a valve body including a flow passage extending from one extremity to the other extremity of said valve body and a cavity pivotably housing said ball-plug disposed intermediate said one extremity and said the other extremity of said valve body, said cavity including a first surface substantially coinciding with one of two symmetrical halves of the surface of said ball-plug when said ball-plug is swung to one extreme position wherein the central axis of said flow passage substantially passes through the center of a spherical surface including said hemispherical end of said ball-plug and substantially intersects with the central axis of said ball-plug in an oblique angle; a second surface substantially coinciding with the other of two symmetric halves of the surface of said ball-plug when said ball-plug is swung to the other extreme position opposite to said one extreme position wherein the central axis of said flow passage substantially passes through the center of a spherical surface including said hemispherical end of said ball-plug and substantially intersects with the central axis of said ball-plug in another oblique angle, said first surface and said second surface disposed substantially in a mirror image to one another with respect to a plane perpendicular to the central axis of said flow passage wherein said central axis associated with said first surface and said central axis associated with said second surface intersect one another at a point off-set from the central axis of said flow passage; and a void space intermediate said first surface and said second surface providing room for said ball-plug to swing from said one extreme position to said the other extreme position, wherein said through-hole included in said ball-plug substantially lines up with said flow passage included in said valve body when said ball-plug is swung to said one extreme position;

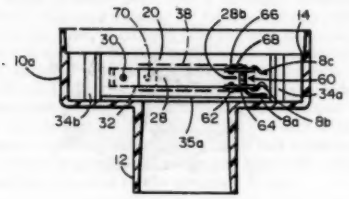
(c) at least one pivoting pin pivotably securing said ball-plug to said valve body wherein the central axis of said pivoting pin substantially passes through said point of intersection between said central axis associated with said first surface and said central axis associated with said second surface in an angle perpendicular to said central axes associated with said first and second surfaces; and

(d) means included in said first and second extremities of said valve body for connecting said valve body to pipe line.

4,546,793
BREATH SWITCH

Josef J. Stupecky, Irvine, Calif., assignor to Sensormedics Corporation, Anaheim, Calif.

Filed Dec. 27, 1982, Ser. No. 453,434
Int. Cl.⁴ F16K *37/00*
U.S. Cl. 137—554 **15 Claims**



1. A switch for indicating the beginning and ending of a pulsatile flow of gas comprising:

(a) a housing having an inlet and first and second outlets,

(b) means defining a first flow path for the flow of gas between the inlet and the first outlet, wherein the first flow path includes a first chamber which is connected to the inlet and to the first outlet,

(c) means defining a second flow path for the flow of gas between the inlet and the second outlet, wherein the second flow path includes a second chamber which is connected to the first chamber and to the second outlet,

(d) a check valve connected in series with the first flow path,

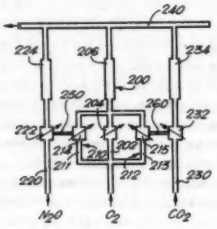
(e) a flow responsive member located between the first and second chambers and connected in series with the second flow path and adapted to move in response to the flow of gas through the second flow path, and

(f) means for indicating the duration of said pulsatile flow in response to the position of said flow responsive member wherein said indicating means is triggered by the flow responsive member in accordance with the flow of gas in the second flow path.

4,546,794
GAS MIXING APPARATUS

Graham J. Ball, Great Dunmow, England, assignor to The BOC Group plc, London, England

Filed Nov. 29, 1983, Ser. No. 556,210
Claims priority, application United Kingdom, Dec. 1, 1982, 8234188
Int. Cl.⁴ G05D *11/03*
U.S. Cl. 137—599 **9 Claims**

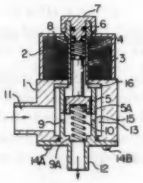


1. A gas mixing apparatus for providing a gas mixture containing at least first, second and third gases, the proportion by volume of the first gas in the gas mixture being maintained above a predetermined lower level, comprising first, second and third paths respectively for the passage therethrough of said first, second and third gases towards a common mixing means, the second and third paths each including a rotatable needle valve for controlling the flow of its respective gas therethrough, the first path being divided for at least a part of its length into at least first and second by-pass passages, each including a rotatable needle valve for controlling the flow of the first gas therethrough, first means interconnecting the needle valve associated with the first by-pass passage with the needle valve associated with the second path and second means interconnecting the needle valve associated with the second by-pass passage with the needle valve associated with the third path, the first and second interconnecting means both being arranged so that rotational movement to open either of the needle valves associated with the second and third paths will also cause the needle valves associated with the first and second by-pass passages respectively to rotate to open to prevent the percentage of the firs gas by volume falling below a predetermined proportion.

4,546,795
SOLENOID VALVE

Yoshio Okamoto, Ibaraki; Kazumi Iwai, Mito; Hiroshi Inoue; Yoshifumi Kunugi, both of Ibaraki, and Tadashi Shinozaki, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 323,573, Nov. 20, 1981, abandoned. This application Oct. 19, 1984, Ser. No. 662,555
Claims priority, application Japan, Dec. 26, 1980, 55-183891; Dec. 26, 1980, 55-183892; Dec. 26, 1980, 55-186478
Int. Cl.⁴ F16K *31/02*
U.S. Cl. 137—624.15 **11 Claims**



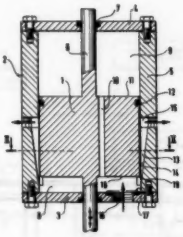
1. A solenoid valve including a fluid inlet, a fluid outlet, a plunger adapted to be reciprocated by an electromagnetic force and a force of a spring so as to selectively open or close one of said fluid inlet and said fluid outlet, a piston valve engageable with said plunger, a cylinder slidably accommodating said piston valve, aperture means provided in one of said piston valve and said cylinder for communicating said fluid inlet with said fluid outlet, said spring is interposed between an upper part of said plunger and a mangetic head mounted on a plunger casing, another spring is interposed between a lower part of said piston valve and a body of said solenoid valve whereby a balance condition is achieved between the electromagnetic force and said spring so as to enable a reciprocation of the plunger, said plunger and piston valve being supported solely by a balance of said two springs without contact of the piston valve with an inner wall of said cylinder, and wherein a pulse signal is applied to an electromagnet of said solenoid valve, with at least a pulse repetition period of said pulse signal being varied in a predetermined manner so as to cause a flow rate of the solenoid valve to change continuously so as to obtain a desired value of the flow rate.

4,546,796

APPARATUS FOR SUPPLYING GAS UNDER PRESSURE AND DISTRIBUTING IT BETWEEN N OUTLETS

Robert Bourquin, Valdieu-Lutran, France, assignor to Alsthom-Atlantique, Paris, France

Filed Jun. 20, 1983, Ser. No. 506,252
Claims priority, application France, Jun. 18, 1982, 82 10642
Int. Cl.[4] F16K *11/07, 47/00*
U.S. Cl. 137—625.48 2 Claims



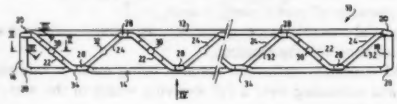
1. Apparatus for supplying gas under pressure and distributing it between a plurality, n, of outlets, the apparatus comprising a piston slidably mounted in a cylinder, a rod fixed to said piston which serves to position the piston axially in the cylinder, said cylinder including a base provided with a gas inlet underlying the piston, said cylinder having a side wall with n openings, each opening being connected to a corresponding gas outlet; said piston being sized such that, when in a base end position, it serves to block communication between the inlet and the outlets; the improvement wherein the openings in the cylinder side wall are constituted by longitudinal grooves internally of said side wall, which grooves extend over a shorter length than the axial extent of the piston, and whose radial depth in the thickness of the wall increases with distance from said base, the end of each groove remote from said base being connected to an associated gas outlet, and each groove constituting together with the piston, a convergent-divergent nozzle.

4,546,797

TURBULATOR FOR A HEAT EXCHANGER COMPRISING A BUNDLE OF TUBES, AND A HEAT EXCHANGER INCLUDING SUCH TURBULATORS

Patrick Cadars, Montigny, France, assignor to Valeo, Paris, France

Filed Jun. 1, 1983, Ser. No. 500,081
Claims priority, application France, Jun. 14, 1982, 82 10352
Int. Cl.[4] F28F *13/12*
U.S. Cl. 138—38 14 Claims



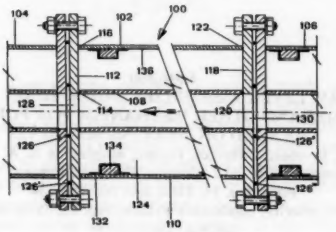
1. A turbulator suitable for insertion into a fluid circulation tube to increase turbulence in the flow of fluid inside the tube, in particular in a heat exchanger having a bundle of tubes for a motor vehicle, said turbulator comprising two laterally spaced parallel longitudinal bars, each of said longitudinal bars having ends and axes defining a common longitudinal plane, the corresponding ends of said bars being in general lateral alignment, two end cross bars interconnecting the corresponding ends of the said longitudinal bars to define a rectangular frame, and elongated cross-pieces within said frame, said cross-pieces having a portion extending between and terminating at the said two longitudinal bars, said cross pieces having a further portion projecting perpendicularly from a longitudinal plane defined by the axes of the said two longitudinal bars, said turbulator, including said longitudinal bars, cross bars and cross-pieces, being of onepiece construction.

4,546,798

VACUUM INSULATED FLUID TRANSPORT PIPES AND METHOD OF CONSTRUCTION

Paolo D. Porta, Milan, Italy, assignor to S.A.E.S. Getters S.p.A., Milan, Italy

Filed Apr. 22, 1983, Ser. No. 487,910
Claims priority, application Italy, May 30, 1982, 21395 A/82
Int. Cl.[4] F16L *9/18*
U.S. Cl. 138—149 3 Claims



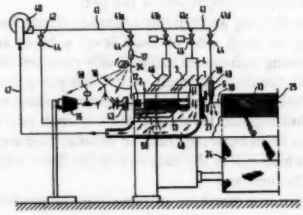
1. A fluid transfer pipeline section comprising an inner metal cylindrical tube, a substantially coaxial outer metal cylindrical tube, a first metal flange joining first adjacent ends of the inner and outer cylindrical tubes in a vacuum-tight manner, a second metal flange joining second adjacent ends of the inner and outer cylindrical tubes in a vacuum-tight manner thus defining an evacuated jacket, first and second flanges adapted for joining the pipeline section in a fluid-tight manner to additional pipeline sections and adapted to allow continuous fluid flow through the inner metal cylindrical tube wherein a getter device is in thermal contact with the inner wall of the outer cylindrical tube, said getter device comprising a thin metal strip provided with alternate bending zones and getter material support zones, said getter material being a non-evaporable getter material capable of the permanent sorption of active gases and the reversible sorption of hydrogen.

4,546,799

DEVICE FOR CLEANING THE WEFT INSERTION AREA OF A WEAVING MACHINE

Peter Riesen, Elgg, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sep. 27, 1984, Ser. No. 655,146
Claims priority, application European Pat. Off., Oct. 11, 1983, 83110110.0
Int. Cl.[4] D03D *49/00*
U.S. Cl. 139—1 C 10 Claims



1. In combination

a weaving machine having a picking mechanism and a thread shear disposed along a thread path;

a nozzle for directing a vertical air curtain between said picking mechanism and said shear transversely of said thread path; and

a cover plate between said nozzle and said shear to limit said air curtain from said shear.

4,546,800

DRAW LEVER ASSEMBLIES MOUNTED ON THE DOBBIES AND OTHER MECHANISM FOR FORMING THE SHED ON WEAVING MACHINES

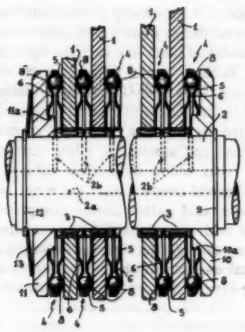
Jean P. Froment, Faverges, France, assignor to S. A. des Etablissements STAUBLI (France), Faverges, France

Filed Sep. 14, 1984, Ser. No. 650,734

Claims priority, application France, Sep. 21, 1983, 83 15198

Int. Cl.[4] D03C *1/00*

U.S. Cl. 139—66 A 4 Claims



1. In a weaving machine of the type having multiple oscillating draw levers for controlling the shed of the machine and the oscillating levers being supported side by side for oscillation about a pin which is fitted with respect to the machine, improved lever bearing and guiding assembly means for supporting and positioning the oscillating levers on the pin, comprising:

through each lever an opening through which the pin passes, and bearing means between the lever and the pin operative to support the lever on the pin;

said lever bearing and guiding assembly means further comprising on each side of each lever a lever stop means comprising two paired and mutually opposed discs having central openings through which the pin passes and the discs being supported on said bearing means adjacent to and abutting said levers, the discs of each pair being profiled to form between them an annular raceway carrying balls which roll in the raceway as the discs rotate relative to eachother; and

disc supporting members surrounding the pin and abutting the outer discs at the ends of the bearing and guiding assembly means and being operative to maintain axial pressure thereon.

4,546,801

WARP LET-OFF CONTROL DEVICE FOR WEAVING MACHINES

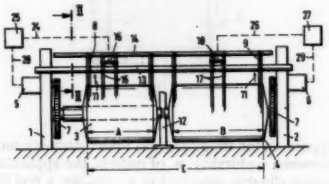
Robert Bucher, Frick, and Walter Küng, Tann-Dürnten, both of Switzerland, assignors to Maschinenfabrik Sulzer-Rüti AG, Rüti, Switzerland

Filed Sep. 14, 1984, Ser. No. 650,858

Claims priority, application European Pat. Off., Oct. 3, 1983, 83810441.2

Int. Cl.[4] D03D *49/06*

U.S. Cl. 139—110 5 Claims



1. A warp let-off control device for a weaving machine, comprising:

warp beam means for delivering a warp containing warp threads at a predeterminable let-off speed;

a stationary deflection element cooperating with the warp and arranged subsequent to said stationary warp beam with respect to a predetermined direction of motion of the warp;

a tensioning beam movable by spring action and arranged subsequent to said deflection element with respect to said direction of motion of the warp;

a sensing element arranged at the warp at a location between said stationary deflection element and said tensioning beam for sensing tension of at least predetermined ones of said warp threads of the warp;

means for adjusting the predeterminable let-off speed of the warp from the warp beam means in response to the thread tension sensed by the sensing element;

said warp beam means comprising a plurality of partial warp beams;

said sensing element comprising separate sensing elements with each said separate sensing element being operatively associated with a respective partial warp beam of said plurality of partial warp beams;

a partial control device operatively associated with each said separate sensing element;

said stationary deflection element being made in one piece and extending over a full weaving width of the weaving machine;

said tensioning beam being made in one piece and extending over the full weaving width of the weaving machine;

each of said sensing elements comprising a sensing roller subject to spring action;

each of said plurality of partial warp beams having a respective predetermined width;

each of said sensing rollers being operatively associated with a predetermined one of said plurality of partial warp beams; and

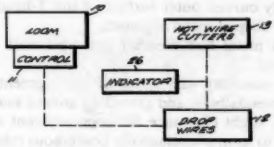
each of said sensing rollers at most extending over said respective predetermined width of each associated one of said partial warp beams.

4,546,802

AUTOMATIC FAILURE SENSOR FOR HOT WIRE CUTTERS

Robert H. Best, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Jun. 4, 1984, Ser. No. 616,684
Int. Cl.[4] D03D *51/00*
U.S. Cl. 139—336 20 Claims



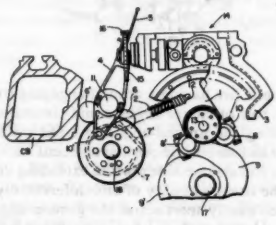
1. In combination with a loom having a plurality of hot wire cutters for trimming selvage and the like, means for stopping operation of the loom in response to burnout, or like failure, of one of the cutter wires.

4,546,803

RELIEF MEANS FOR THE DRIVE MECHANISMS OF COMPONENTS ALTERNATINGLY ROCKING BETWEEN TWO END POSITIONS

Peter Dornier, Lindau, Fed. Rep. of Germany, assignor to Lindauer Dornier Gesellschaft mbH, Lindau, Fed. Rep. of Germany

Filed Sep. 7, 1983, Ser. No. 530,009
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1983, 3325591
Int. Cl.[4] D03D *47/00, 49/60*
U.S. Cl. 139—449 5 Claims



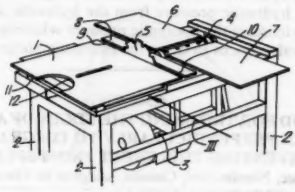
1. A system for relieving drive means of a weaving machine having separate components with different functions, comprising first and second separate and different drive means each including a respective different moving member for driving a respective one of said separate components having a different function alternatingly back and forth between two end positions, a single energy storing means (2) having two ends, one end of said energy storing means being connected to one of said different moving members, the other end of said energy storing means being connected to the other different moving member, and wherein the alternating motions of said different moving members are substantially free of overlap in their back and forth movement.

4,546,804

WOODWORKING MACHINE

Oyvind Haeger, Ulvåsveien 3, Gimle, 1750 Halden, Norway

Filed Feb. 2, 1983, Ser. No. 463,305
Claims priority, application Norway, Feb. 16, 1982, 820472
Int. Cl.[4] B27C *9/02*
U.S. Cl. 144—1 G 2 Claims



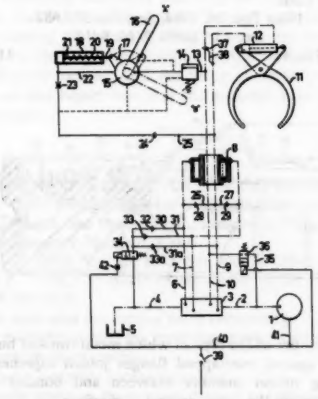
1. In a woodworking machine: a support stand; motor-driven drive means for a plurality of rotatable woodworking tools and means for mounting said drive means on said support stand, said drive means including a motor and a tool-receiving arbor driven by the motor; a worktable for supporting a workpiece, said table comprising a plurality of sections arranged with openings between them for the various tools, one of said table sections having an edge which defines an edge of one of said tool-receiving openings; and mounting means for said one table section providing for movement of said one table section in a single plane in two directions which are perpendicular to each other, movement in one of said directions being toward and away from at least one other table section which has an edge defining a further edge of said one tool-receiving opening whereby movement in said one direction enlarges or reduces the size of said one tool-receiving opening.

4,546,805

DEVICE FOR ROTATOR AND GRAPPLE UNIT SUSPENDED AT A BOOM END

Lennart Jahr, Alfta, and Sven Wickström, Bollnäs, both of Sweden, assignors to OSA AB, Alfta, Sweden

Filed Sep. 2, 1983, Ser. No. 528,965
Claims priority, application Sweden, Sep. 3, 1982, 8205028
Int. Cl.[4] A01G *23/08*
U.S. Cl. 144—34 R 5 Claims



1. A tree handling device comprising a hydraulic cutting means, a rotator having a first pair of flexible hydraulic operat-

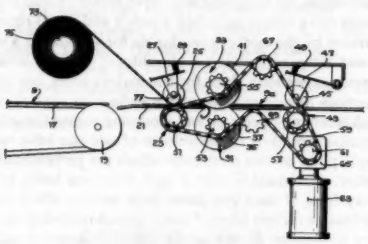
ing supply and return lines, a grapple having a second pair of flexible hydraulic operating supply and return lines, said first and second supply and return lines connected to a control valve means to control hydraulic fluid from a hydraulic source, a branch line connected to the second supply line, the branch line having a pressure sensitive valve to supply fluid pressure to the hydraulic cutting means, the rotator and grapple being operable and the pressure-sensing valve being closed at a first hydraulic pressure from the hydraulic source, and a means to increase the hydraulic pressure whereby the pressure sensing valve opens to drive the hydraulic cutting means.

4,546,806

METHOD FOR TRIMMING THE EDGES OF A SHEET OF VENEER PERPENDICULARLY TO ITS GRAIN WHILE PREVENTING THIS SHEET FROM SPLITTING

Luc Dubuc, Nicolet-Sud, Canada, assignor to Placages Nicolet-Sud Inc., Nicolet-Sud, Canada

Filed Mar. 27, 1984, Ser. No. 594,028
Int. Cl.⁴ B27F *7/00*; B27L *5/02*
U.S. Cl. 144—345 **10 Claims**



1. A method for trimming the edges of a sheet of veneer perpendicularly to its grain while preventing said sheet from splitting, said method comprising the steps of:

applying a strip of tape onto the sheet of veneer close to each of its edges to be trimmed, and

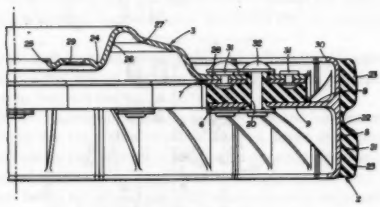
subsequently trimming said edges by shear.

4,546,807

PASSENGER VEHICLE SPARE TIRE CONSTRUCTION

William T. Cummins, Mogadore, and Wallace A. Lobdell, Canton, both of Ohio, assignors to Teledyne Industries Inc., Los Angeles, Calif.

Filed Feb. 16, 1984, Ser. No. 580,682
Int. Cl.⁴ B60B *9/10, 9/12*
U.S. Cl. 152—41 **11 Claims**



1. A spare tire of the type in which metal rim and hub members have spaced overlapped flanges joined together by an intervening rubber member between and bonded to said flanges, wherein the improvement comprises:

(a) rim means comprising a series of rim segment assemblies each of which includes,

(1) a metal segment T-shaped in axial cross section having a cylindrically curved T-head portion and a circumferentially extending, flat T-stem portion projecting radially inward from said T-head portion;

(2) a sheet metal segment member thinner than said T-stem portion;

(3) a rubber block intervening said T-stem portion and said sheet metal segment member having opposite portions vulcanized-bonded to said T-stem portion and said sheet metal segment member, thereby forming an integral segment assembly; and

(4) a layer of tread rubber vulcanized-bonded to the cylindrically curved outer surface of the T-head portion of said T-shaped metal segment;

(b) a sheet metal hub member provided with an annular recess; and

(c) means mounting said series of rim segment assemblies circumferentially on and extending around said hub member with slight clearance between adjacent segment assemblies to form a substantially continuous rubber-treaded unitary spare tire;

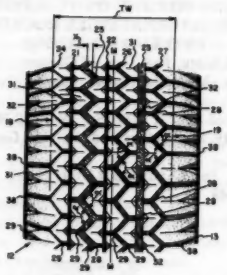
(d) whereby the rubber blocks between said rim means and hub member provide for energy absorption of forces to which the spare tire is subjected in use on a passenger vehicle equipped with said spare tire.

4,546,808

PNEUMATIC TIRE

Jean F. L. Fontaine, Bürden, and Maurice Graas, Luxembourg, both of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 6, 1984, Ser. No. 568,971
Int. Cl.⁴ B60C *11/06*
U.S. Cl. 152—209 R **8 Claims**



1. A pneumatic tire having a ground-engaging tread portion comprising: a pair of lateral edges, a mid-circumferential centerplane dividing the ground-engaging tread portion into an inside portion and an outside portion adjacent each other, said inside portion and said outside portion extending circumferentially about the tire, a plurality of circumferentially extending grooves spaced axially apart across the ground-engaging tread portion, said plurality of grooves comprising a first and a second groove of a first configuration, a first and a second groove of a second configuration, said first groove of said first configuration having a width greater than the width of the second groove of said first configuration, said first groove of said second configuration having a width greater than the width of the second groove of said second configuration, said first groove of said first configuration being disposed on one side of said mid-circumferential centerplane and said first groove of said second configuration being disposed on the other side of said mid-circumferential centerplane, the second groove of said first configuration being disposed on said other side of said mid-circumferential centerplane and the second groove of said second configuration being disposed on said one side of said mid-circumferential centerplane, so that the ratio of

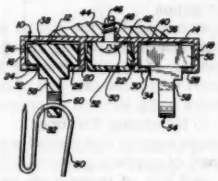
groove to tread on the inside and outside portions is substantially equal.

4,546,809

DUAL TRACK DRAPERY SUPPORT DEVICE

Elden E. Hadfield, 1533 Meadowlark La., Lakepoint, Utah 84074

Filed Nov. 25, 1983, Ser. No. 555,178
Int. Cl.[4] A47H *1/10*
U.S. Cl. 160—126 **5 Claims**



1. A drapery support device comprising, an elongate bar, said bar being of generally rectangular cross-sectional configuration and including a pair of elongate tracks extending the length thereof, said tracks arranged in parallel disposition with a space therebetween, each track including an inner facing side wall, said space being defined by an extension between said inner facing side walls joining said tracks, a plurality of apertures formed in said extension to permit securement of said support device to a surface by fasteners disposed through said apertures into said surface, said fasteners being positioned at a location between said tracks when disposed through said apertures, removable imperforate shield means extending between said inner facing side walls to decoratively bridge said space and conceal said fasteners, a plurality of carriers disposed in said tracks for slidable movement therein, each carrier having a lug formed theron and projecting beyond said tracks, a master carrier positioned in each respective track for slidable movement therein with a preselected number of carriers located in said tracks behind each master carrier, a plurality of depending lugs formed on each said master carrier projecting beyond said tracks, means to secure a drapery panel to each carrier, means for securing a lead edge of a drapery panel to a respective master carrier, and means for movement of said master carriers along said tracks whereby movement of a master carrier causes each carrier positioned along the track in which the master carrier is located also to move behind the master carrier.

4,546,810

METHOD FOR THE MANUFACTURE OF MOLDS USING CASTING SAND OR ANOTHER MIXTURE OF RAW MATERIAL PARTICLES

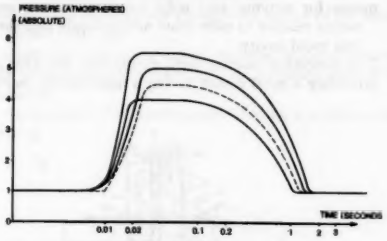
Christoph Landolt, Thayngen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

PCT No. PCT/CH82/00131, § 371 Date Aug. 11, 1983, § 102(e) Date Aug. 11, 1983, PCT Pub. No. WO83/02078, PCT Pub. Date Jun. 23, 1983
PCT Filed Dec. 9, 1982, Ser. No. 531,827
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1981, 3149172
Int. Cl.[4] B22C *15/00*
U.S. Cl. 164—37 **13 Claims**

1. A method for manufacturing molds from casting sand or other mixture comprising raw material particles, binder and water, by applying a pressure surge wave to said casting sand or other mixture in a closed chamber, said pressure surge wave being formed by a process comprising the steps of:

(a) starting from atmospheric pressure in said chamber, increasing said pressure with a pressure gradient of at least about 50 atmospheres/sec to a maximum pressure of at least about 2 atmospheres;

(b) maintaining said maximum pressure of at least about 2 atmospheres for at least about 0.01 seconds;



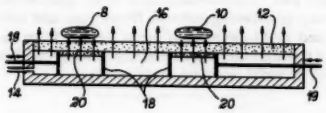
(c) reducing said pressure from said maximum pressure to atmospheric pressure within at least about 0.2 seconds from the initiation of the pressure increase.

4,546,811

PROCESS FOR THE TREATMENT OF A LIQUID MASS

Claude Potard, Saint Egreve, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 8, 1982, Ser. No. 396,358
Claims priority, application France, Jul. 17, 1981, 81 13966
Int. Cl.[4] B22D *23/00*
U.S. Cl. 164—66.1 **8 Claims**



1. A process for the treatment of a liquid mass comprising the steps of providing an apparatus having at least one gas-permeable wall made from a porous fritted material or perforated by narrow ducts, said wall being level and of substantially planar shape, causing a pressurized gas to flow through said wall, disposing said liquid mass in the vicinity of said wall whereby a pressurized gaseous film supporting said mass is formed separating said liquid mass from said wall, and positioning said mass without any contact thereof with said wall, by locally varying the pressure of said gaseous film by moving a member on the side of said wall opposite to that where said liquid mass is located, said gas being chemically inert with respect to said liquid mass and the material from which said wall is made.

4,546,812

METHOD AND APPARATUS FOR IMPROVING THE DENSITIES OF CAST PARTS

Ralph G. Tiegel, San Carlos, Calif., assignor to Tiegel Manufacturing Company, Belmont, Calif.

Filed Sep. 30, 1983, Ser. No. 537,650
Int. Cl.[4] B22D *23/00, 39/00, 41/08*
U.S. Cl. 164—130 **10 Claims**

1. An apparatus for casting parts comprising:

ladle assembly means for receiving molten casting material preparatory to casting,

said ladle assembly means including:

a ladle sprue in the bottom thereof communicating with mold means; and

venting means positioned within said sprue for venting air during casting;

said mold means relatively displaceable with respect to said ladle assembly means including:

a surface for supporting said ladle assembly

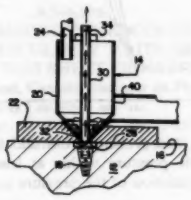
means and closing said sprue; and

at least one mold cavity locatable under said ladle means for casting; and

means for moving said ladle assembly means and mold means relative to each other and to locate said sprue over said mold cavity.

7. A method of casting parts, comprising the steps of:

providing a mold means having a mold cavity therein;



providing a ladle means having molten casting material therein, said ladle means comprising a ladle, a sprue in the bottom of said ladle and a venting means extending from said sprue and back through said ladle, said ladle means supported upon and said sprue and said venting means closed off by the surface of said mold means;

displacing said ladle means and said mold means relative to each other, such that said sprue and said venting means are opened and in communication with said mold cavity, whereby said casting material flows from said ladle means into said mold cavity and air is vented from said mold cavity through said venting means during the flow of the casting material into said mold cavity.

4,546,813

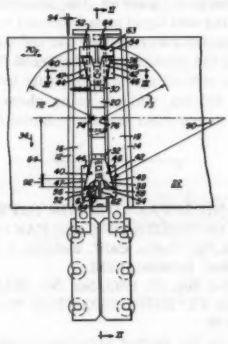
ADJUSTABLE INSERT FOR TWIN CASTING

John A. Grove, Franklin, and John W. Grove, Seneca, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Feb. 19, 1985, Ser. No. 703,060

Int. Cl.[4] B22D *11/00, 11/04*

U.S. Cl. 164—420 **6 Claims**



1. In an insert for a continuous caster mold, said mold having opposed pairs of broad and narrow mold walls, said insert being adapted for mounting between the broad mold walls in order to facilitate the casting of plural strands in the mold, said insert having opposed wall faces aligned facing the narrow mold walls, said insert having means for adjusting the angular alignment of said opposed wall faces with respect to a direction in which metal is cast through the mold,

the improvement in said insert for adjusting the spacing as well as the angular alignment of said exposed wall faces which comprises:

a plate member centrally located between said opposed wall faces and aligned generally parallel thereto, said plate member being adapted for attachment to the broad mold walls, said plate member having a pair of slots extending through said plate member to openings facing toward the opposed wall faces, said slots being located at spaced positions adjacent opposed ends of the insert wall faces in the casting direction,

a pair of wedges mounted in the slot so as to be slidably movable in said slots in the casting direction, said wedges having a first pair of opposed pressure contact surfaces facing the insert wall faces, said pair of opposed pressure contact surfaces being inclined at opposed equal angles with respect to the casting direction,

a first pair of ramps secured to the insert wall faces adjacent to the first pair of opposed pressure contact surfaces of said wedge, said pair of ramps each having a pressure contact surface mateably aligned with respect to one of said first pair of pressure contact surfaces of said wedge,

at least one pressure contact surface in each adjoining pair of wedge and first pair of ramp pressure contact surfaces having a convex curvature sufficient to permit tilting of said insert wall faces with respect to the plate member at the various spacing distances of the wedges in said slots,

means for tiltably connecting the insert wall faces to the plate member, and

means for independent actuation of the wedge in each slot in order to slidably move said wedge in the casting direction and adjust the distance of spacing between the wedges in said slots, thereby adjusting the spacing and angular alignment of the insert wall faces.

5. A method of installing an insert in a continuous caster mold so as to enable the casting of plural strands in the mold, said mold having opposed pairs of broad and narrow mold walls, said insert having opposed wall faces of width mateable with the narrow wall of the mold, said opposed wall faces having an outer surface adapted for contact by molten metal in the mold, said method comprising:

(a) placing said insert in the mold between the opposed broad mold walls so that the opposed wall faces are aligned facing toward the narrow mold walls,

(b) adjusting the spacing between a first end of said opposed wall faces with respect to a direction of casting metal through the mold so that the outer surfaces of said first end of the opposed wall faces is positioned at a first predetermined location with respect to the broad mold walls,

(c) separately adjusting the spacing between a second end of said opposed wall faces with respect to the casting direction so that the outer surface of said second end of the opposed wall faces is positioned at a second predetermined location with respect to the broad mold walls,

(d) then making minor corrections in the spacing of the first and second ends of said opposed wall faces so as to correct the angular alignment of said opposed wall faces.

4,546,814

PROCESS AND APPARATUS FOR THE PRODUCTION OF RAPIDLY SOLIDIFIED METALLIC TAPES BY DOUBLE-ROLL SYSTEM

Kiyoshi Shibuya; Masao Yukumoto; Takahiro Kan, and Yo Ito, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed May 23, 1983, Ser. No. 496,849

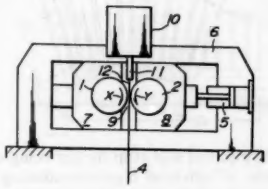
Claims priority, application Japan, May 24, 1982, 57-87690

Int. Cl.[4] B22D *11/16*

U.S. Cl. 164—455 **2 Claims**

1. In a process for producing rapidly solidified metallic tapes by a double-roll system, which process includes pouring mol-

ten metal into a kissing region defined between a fixed cooling roll and a movable cooling roll capable of contacting with and leaving from the fixed cooling roll, through a nozzle located thereabove, said molten metal rapidly solidifying at the kissing region to form a metallic tape, the improvement which comprises adding pushing forces exerted on the movable cooling



roll by arranging hydraulic cylinders at driving and operational sides of the movable cooling roll, respectively, and controlling the pushing forces by adding to or subtracting from a predetermined standard pushing force value, an adjusting quantity as a function of the difference between a roll gap at the driving side and a roll gap at the operational side of the movable cooling roll.

4,546,815

CONTINUOUS CASTING USING IN-LINE REPLACEABLE ORIFICES

Howard H. Liebermann, Succasunna, and James Riesenfeld, Basking Ridge, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

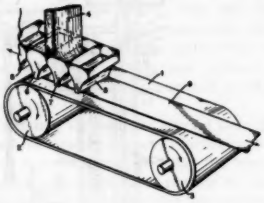
Filed Dec. 28, 1984, Ser. No. 687,078
Int. Cl.[4] B22D *11/06*
U.S. Cl. 164—463 **29 Claims**

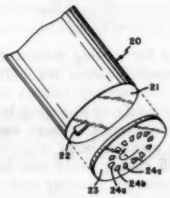
1. A method of continuously forming a solid structure comprising the steps of:
(a) providing a continuous stream of molten material,
(b) providing a first vessel and a second vessel, each vessel having an opening at one end and an orifice at another end and having their openings adjoining each other,
(c) directing the stream toward the opening in the first vessel and moving the vessels relative to the stream, whereby the stream successively passes
(i) into the opening and through the orifice of the first vessel only,
(ii) into the openings and through the orifices of both the first and second vessels, and
(iii) into the opening and through the orifice of the second vessel only, and
(d) chilling the molten material that emerges from the orifices to effect quenching and solidification of the material.

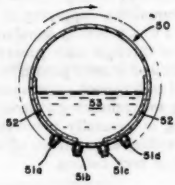
7. A method for continuously forming a solid structure comprising the steps of:
(a) providing molten material in a vessel that has an opening at one end and is adapted for fluid communication with a plurality of orifices at another end,
(b) controlling the flow of molten material out of the vessel and through the orifices to successively provide a flow of molten material from
(i) a first orifice only,
(ii) the first orifice and an adjacent second orifice, and
(iii) the second orifice only, and
(c) chilling the molten material that emerges from the orifices to effect quenching and solidification.

13. An apparatus for continuously forming a solid structure comprising:
(a) a plurality of vessels, each having an opening at one end in fluid communication with an orifice at another end, with the opening in each vessel adjoining the opening in each adjacent vessel,
(b) means for directing a continuous stream of molten material and for moving the vessels relative to the stream, whereby the stream successively passes
(i) into the opening and through the orifice of a first vessel only,
(ii) into the openings and through the orifices of both the first vessel and a second vessel, and
(iii) into the opening and through the orifice of the second vessel only, and
(c) means for chilling the molten material that emerges from the orifices to effect quenching and solidification of the material.

20. An apparatus for continuously forming a solid structure comprising:







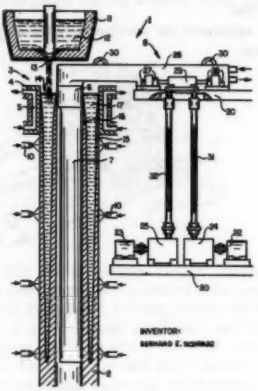
(a) a vessel that is adapted for holding-molten material and that has an opening at one end and is adapted for fluid communication with a plurality of orifices at another end,
(b) means for controlling the flow of molten material out of the vessel and through the orifices to successively provide a flow of molten material from
(i) a first orifice only
(ii) the first orifice and an adjacent second orifice, and
(iii) the second orifice only, and
(c) means for chilling the molten material that emerges from the orifices to effect quenching and solidification, wherein said chilling means comprises a moving chill surface and the first and second orifices are separtated in the direction of chill surface motion.

4,546,816

METHOD AND APPARATUS OF CONTINUOUSLY CASTING HOLLOW ROUND BILLETS WITH A HYPOCYCLOIDAL MANDREL AND AN INSIDE ROLLING PROCESS

Gerhard E. Schwarz, 33020 Lake Rd., Avon Lake, Ohio 44012

Continuation of Ser. No. 233,556, Feb. 11, 1981, abandoned.
This application Nov. 14, 1983, Ser. No. 551,509
Int. Cl.[4] B22D *11/00*
U.S. Cl. 164—465 31 Claims



1. Apparatus for casting hollow billets, comprising mold means and mandrel means for defining boundaries within which at least substantially molten material may at least partially initially solidify as a casting body having substantially solid exterior and interior surfaces, said mandrel means including a rotatable mandrel body positioned in a hollow interior portion of such casting body and having a curved exterior surface and means for rotating and translating said mandrel body in generally hypocycloid-like manner within such casting body thereby to effect substantial rolling engagement of said mandrel body with such interior surface of the casting body, whereby the interior of such hollow casting body accordingly will have a larger cross-sectional dimension than the cross-sectional dimension of said mandrel body.

24. A method of casting hollow round billets, tubes or other castings, comprising supplying at least substantially molten material to a first generally annular mold, allowing such material to move through such generally annular mold while at least exterior and interior generally solid surfaces form on such casting, and rolling such internal surface, said last step including rotating and translating a mandrel in the hollow interior of such casting in generally hypocycloid-like manner to effect substantial rolling engagement of said mandrel with the interior surface of such casting.

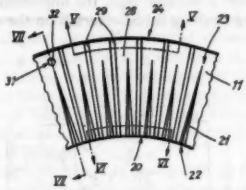
4,546,817

ROTOR FOR A REGENERATIVE HEAT EXCHANGER

Heinz Wieland, Waldenburg, Fed. Rep. of Germany, assignor to Wilhelm Gebhardt GmbH, Fed. Rep. of Germany

Filed Mar. 8, 1984, Ser. No. 587,405
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1983, 3308445
Int. Cl.[4] F28D *19/00*
U.S. Cl. 165—10 16 Claims

1. A tubular regenerative heat exchanger rotor comprising a tubular wall made of a material for taking up and giving up heat said wall being made up of at least one layer of a helically coiled strip placed on edge so as to be lined up with a line that is radial with respect to an axis of said tubular rotor, said strip being provided with radially oriented grooves which pucker or tie up the strip in the region of its inner edge, the strip being coiled onto a core that has a structure designed to let fluid flow therethrough, the radially oriented grooves being wedge-like with a wider section of the wedge-like groove being at the radially inner edge and extending only over a part of the



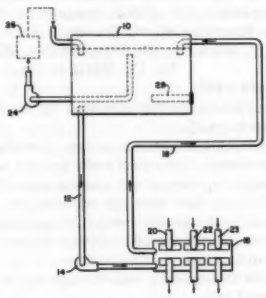
breadth of said strip, and said strip further being corrugated with corrugations of individual layers constituting fitting regions which lie sealingly one against the next so as to prevent flow in circumferential or axial direction.

4,546,818

MULTIPLE SOURCE ENERGY RECOVERY SYSTEM

Otto J. Nussbaum, Huntsville, Ala., assignor to Halstead Industries, Inc., Scottsboro, Ala.

Filed Oct. 28, 1982, Ser. No. 437,492
Int. Cl.[4] F28F *1/32*
U.S. Cl. 165—47 5 Claims



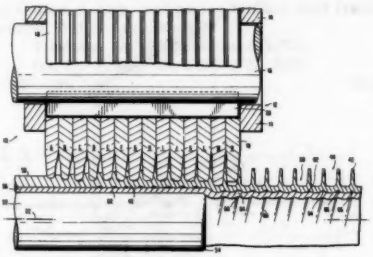
1. A multiple source energy recovery system comprising a heat exchange medium, a storage tank for said heat exchange medium, a plurality of separate heat-bearing fluid sources, a first heat exchanger having a plurality of primary fluid circuits permanently connected to respective ones of said heat-bearing fluid sources, a secondary fluid circuit in said first heat exchanger for circulating said heat exchange medium between said first heat exchanger and said storage tank, said first heat exchanger comprising a finned coil heat exchanger through which said primary and secondary circuits extend, said primary circuits including a plurality of respective input headers and output headers interconnected by tubes for conducting fluid through respective ones of said primary circuits, said secondary circuit comprising a serpentine tube extending between the tubes of each of said primary circuit, said primary and secondary circuits being physically separated but thermally interconnected by fins of said first heat exchanger and said primary circuits are each physically separated from each other but said fins are common to all of said primary circuits and said secondary circuit, a second heat exchanger, and means for circulating said heat exchange medium between said storage tank and said second heat exchanger where heat recovered from said primary circuits is utilized.

4,546,819

DOUBLE WALL HEAT EXCHANGER

Robert E. O'Connor, Greenville, R.I., assignor to Amtrol Inc., West Warwick, R.I.

Filed Feb. 10, 1984, Ser. No. 579,170
Int. Cl.[4] F28F *11/00*
U.S. Cl. 165—70 **18 Claims**



1. Double wall tubing which comprising:

(i) an outer tube having an outer helical fin and a continuous, small helical groove on the inside of the outer tube, the helical groove following the helical path of the outer helical fin;

(ii) an inner tube (a) having a small continuous axial groove located on the outer perimeter of the inner tube and (b) having a slightly-raised helical protrusion which mates with the inner helical groove of the outer tube, the slightly-raised helical protrusion being comprised of a number of segments caused by the axial groove, each segment of the slightly-raised helical protrusion being uninterrupted; and

(iii) a continuous, narrow helical passageway between the inner tube and outer tube formed by the mating continuous, small helical groove and the slightly-raised helical protrusion, said continuous, narrow helical passageway being unimpeded and extending from one end of said double wall tubing to the outer end thereof,

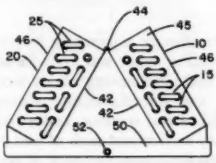
the inner surface of the outer tube, except in the region of the inner, continuous, small helical groove thereof, contacting the outer surface of the inner tube, except in the region of the slightly-raised helical protrusion and in the region of the axial groove of the inner tube, the axial groove communicating with each end of each winding of the helical passageway.

4,546,820

METHOD AND APPARATUS FOR FORMING HEAT EXCHANGER ASSEMBLIES WITH BENDABLE TUBE SHEET FLANGES

Charles E. Whipple, Brewerton, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 1, 1983, Ser. No. 481,189
Int. Cl.[4] F25D *21/14*
U.S. Cl. 165—77 **3 Claims**



1. A heat exchanger assembly which comprises:

a first tube sheet including a face portion defining circular openings therein and including at least one first flange angled from and extending along a longitudinal side of the face portion of said entire first tube sheet, said tube sheet defining a first variable bending slot extending transversely across the face portion of the first tube sheet forming a first tube sheet portion and a second tube sheet portion but not across the first flange leaving a first pivotal flange connecting portion;

a pair of fin bundles formed from numerous parallel fins each defining openings which are arranged in registration with the openings in the first tube sheet;

a second tube sheet also defining openings in a face portion in registration with the openings in the fin bundles, said second tube sheet in parallel spaced relation to said pair of fin bundles and said first tube sheet, said second tube sheet comprises a second flange angled from and extending along a longitudinal side of the second tube sheet face parallel to said first flange and a second variable bending slot extending across the second face portion but not across the second flange leaving a second pivotal flange connecting portion;

hairpin tubes extending through the second tube sheet, the fin bundles and the first tube sheet to form two coil cores,

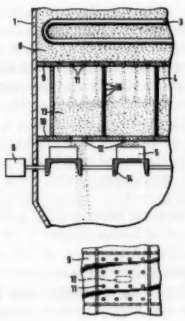
wherein one coil core is located such that the hairpin tubes extend through the first tube sheet portion on one side of the first variable bending slot and the hairpin tubes of the other coil core extend through the second tube sheet portion of the first tube sheet on the opposite side of the first variable bending slot whereby the two coil cores may be displaced relative to each other from an in-line position to a parallel side-by-side position by bending the first tube sheet at the first pivotal flange connecting portion and the second tube sheet at the second pivotal flange connecting portion.

4,546,821

HEAT EXCHANGER WITH BULK MATERIAL RETARDER SYSTEM

Joachim Kümmel, Tuerkisweg 4, D-4044 Kaarst 2, Fed. Rep. of Germany

Filed Jun. 25, 1984, Ser. No. 624,295
Int. Cl.[4] F28C *3/10*; F26B *17/12*; B65D *47/00*
U.S. Cl. 165—96 **4 Claims**



1. Apparatus for controlling the flow characteristics of bulk material through a heat exchange structure, comprising:

(a) a housing including a top wall and side walls,

(b) an inlet in said top wall for receiving bulk material,

(c) said side walls extending downwardly from said top wall terminating at a discharge funnel,

(d) said housing defining an internal space for directing the flow of said bulk material,

(e) said internal space including an upper zone and a lower zone,

(f) a heat exchanger positioned in said upper zone,

(g) an upper cascade plate extending between said side walls and situated between said upper zone and said lower zone,

(h) said upper cascade plate including a plurality of openings formed therein,

(i) a lower cascade plate extending between said side walls spaced from and positioned beneath said upper cascade plate,

(j) said lower cascade plate having a plurality of openings, the number of openings being substantially less than the number of openings in said upper cascade plate, and the size of said openings being substantially greater than the size of said openings in said upper cascade plate,

(k) a plurality of perforated spacer plates extending vertically between said upper and said lower cascade plates, and together with said upper and said lower cascade plates forming a plurality of intercommunicating cascade chambers,

(l) each of said openings in said lower cascade plate forming a centrally located discharge passage for each of said cascade chambers, and

(m) movable flow regulating means situated beneath said lower cascade plate for controlling the accumulation of bulk material in said cascade chambers.

4,546,822

HEAT EXCHANGER WITH ADHESIVE SEALS

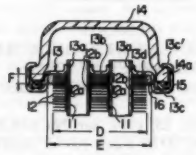
Masami Tamura, Toyota, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 28, 1983, Ser. No. 546,388

Claims priority, application Japan, Nov. 1, 1982, 57-192835; Jul. 22, 1983, 58-134946

Int. Cl.⁴ F28F *9/16*

U.S. Cl. 165—149 **14 Claims**



1. A heat exchanger comprising a tank for momentarily storing a heat-transfer medium, said tank having a peripheral edge defining an opening, a header plate formed therein with a plurality of holes and sealingly secured to said peripheral edge of said tank to close said opening, a plurality of tubes each mechanically connected to one of said holes in said header plate so that said medium can flow through said tubes into and from said tank, said tubes and said header plate being in metal-to-metal gripping engagement with each other, a row of a plurality of fins disposed in heat-exchanging relationship to said tubes and extending substantially parallel to said header plate, and a layer of adhesive disposed on the surface of said header plate adjacent to said row of fins and forming a seal between said header plate and said tubes, said adhesive layer and said row of fins being arranged such that at least the fin which is nearest to said header plate is in engagement with said adhesive layer.

4,546,823

SOLDERLESS RADIATOR

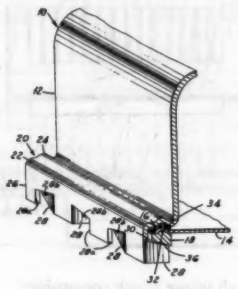
William Melnyk, Lathrup Village, Mich., assignor to McCord Heat Transfer Corporation, Walled Lake, Mich.

Filed Feb. 11, 1985, Ser. No. 700,212

Int. Cl.⁴ F28F *9/02*

U.S. Cl. 165—149 **2 Claims**

1. A radiator comprising a tank having a mounting skirt formed at the lower end thereof, said mounting skirt including a first flange portion extending laterally therefrom and a second flange portion extending vertically downwardly from said first flange portion, a longitudinal groove formed along said first flange portion, and spaced tabs cut in the free edge of the second flange portion, each of said tabs having a tapered upper edge; a header having a groove formed adjacent the peripheral edge thereof such that the protrusion side of the groove substantially exactly matches said longitudinal groove; a clamping strip having a mound formed on the upper surface thereof



substantially exactly matching said groove in said header, and a slope formed on the bottom surface thereof; and a sealing gasket confined between said protrusion side of said groove in said first flange and said longitudinal groove, and compressed therebetween by virtue of said tapered tabs being bent inwardly against said sloped bottom surface of said clamping strip.

4,546,824

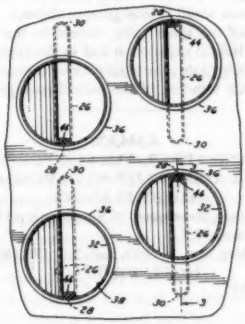
HEAT EXCHANGER

William Melnyk, Lathrup Village, Mich., assignor to McCord Heat Transfer Corporation, Walled Lake, Mich.

Filed Mar. 19, 1984, Ser. No. 591,291

Int. Cl.⁴ F28F *9/18*

U.S. Cl. 165—153 **4 Claims**



1. A heat exchanger comprising upper and lower tanks including respective upper and lower headers, a plurality of tubes, each of said tubes having a body section with flattened, parallel sides and interconnecting rounded edges, axially aligned cylindrical end sections, and a transition section between said body section and each of said cylindrical end sections, and means for connecting each of said plurality of tubes at their cylindrical ends to the respective upper and lower headers, said flattened, parallel sides being off-set in one direction with respect to the axis of said cylindrical end sections such that one side of said transition section is aligned with a side of said cylindrical ends and with one of said rounded edges of said body section, and the opposite side of said transition

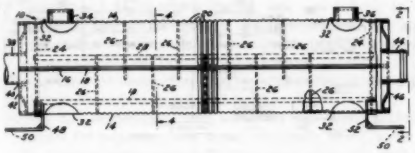
section blends between the other of said rounded edges of said body section and the opposite side of said cylindrical ends.

4,546,825

HEAT EXCHANGER AND METHOD OF ASSEMBLY THEREOF

William Melnyk, Lathrup Village, Mich., and Norman J. Kaarre, Canton, S. Dak., assignors to McCord Heat Transfer Corporation, Walled Lake, Mich.

Filed Jan. 28, 1983, Ser. No. 461,773
Int. Cl.⁴ F28D *7/00*; **F28F** *9/22, 9/02*
U.S. Cl. 165—159 **3 Claims**



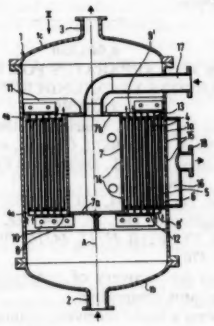
1. A heat exchanger comprising two half circle shells, each having corrugated walls along substantially the full length thereof, said half circle shells being welded together at their mating edges to form a full round shell, a header mounted in the shell in the first corrugation adjacent each end thereof, a plurality of vertically-oriented baffles, each having an arcuate-shaped edge portion, with alternate baffles having their respective arcuate-shaped edge portions oppositely disposed in corrugations at equally spaced intervals within the welded half circle shells, a plurality of aligned openings formed in said headers and baffles, and a tube mounted through each series of aligned openings to form a tube bundle within said full round shell.

4,546,826

SPIRAL HEAT EXCHANGER

Hubertus Zitzmann, Bretten, Fed. Rep. of Germany, assignor to W. Schmidt GmbH & Co. KG, Bretten, Fed. Rep. of Germany

Filed Feb. 7, 1985, Ser. No. 699,400
Claims priority, application Fed. Rep. of Germany, Feb. 8, 1984, 3404374
Int. Cl.⁴ F28D *9/04*
U.S. Cl. 165—163 **8 Claims**



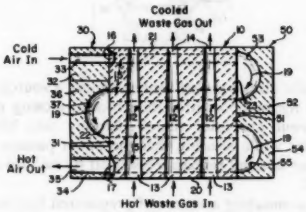
1. In a spiral heat exchanger including a vessel, a plurality of concentric sheet metal spirals situated in said vessel and having a longitudinal axis and defining first and second spiral flow channels for respective first and second fluids for effecting a heat exchange therebetween; first and second closure plates extending perpendicularly to said axis and covering said spirals at opposite spiral edges thereof; mounting bars pressing the closure plates against axially opposite edges of said spirals; said first closure plate defining a first axially oriented opening and said second closure plate defining a second axially oriented opening providing, in said first flow channel, an inlet and an outlet for said first fluid; means defining a radially oriented inlet and a radially oriented outlet in said second flow channel for said second fluid; the improvement wherein said vessel comprises a cylindrical vessel shell entirely surrounding said spirals and further wherein said first closure plate has a radially outer circumferential edge surrounded by said first axially oriented opening and said second closure plate has a radially inner circumferential edge surrounding said second axially oriented opening, whereby said first axially oriented opening communicates with a radially outer part and said second axially oriented opening communicates with a radially inner part of said first flow channel.

4,546,827

MONOLITHIC REFRACTORY RECUPERATOR

Paul L. Wachendorfer, Sr., 120 Twelfth St. NW, Carrollton, Ohio 44615

Division of Ser. No. 718,334, Aug. 27, 1976, Pat. No. 4,156,625. This application Nov. 13, 1978, Ser. No. 960,025
Int. Cl.⁴ F28F *7/02*
U.S. Cl. 165—165 **20 Claims**



1. A heat recuperator comprising:

a monolithic block containing a first array of a plurality of waste gas passages therethrough and a second two dimensional array of a plurality of combustion air passage segments therethrough, said combustion air passage segments being oriented in a direction substantially perpendicular to said waste gas passages, said block being formed as a unit in a single casting; and

at least one turnaround manifold coupled to a surface of said monolithic block and containing a plurality of turnaround passages each of which passages interconnects only one pair of combustion air passage segments, thereby forming a multiple-pass combustion air passage.

4,546,828

DIVERTER SYSTEM AND BLOWOUT PREVENTER

Joseph R. Roche, Humble, Tex., assignor to Hydril Company, Los Angeles, Calif.

Filed Jan. 10, 1984, Ser. No. 569,780
Int. Cl.⁴ E21B *33/06*
U.S. Cl. 166—84 **6 Claims**

1. A system adapted for alternative use as a blowout preventer or a diverter, comprising

a blowout preventer having a resilient packing means and having a closing port and an opening port by which connection of a source of pressurized hydraulic control fluid to the closing port closes the blowout preventer and connection of a source of pressurized hydraulic fluid to the opening port opens the blowout preventer,

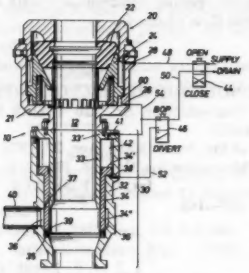
a spool means disposed in series with and below the blowout preventer, the spool means having

a housing having an outlet passage provided in its wall,

a diverter piston having an annular wall and disposed within the housing,

a lower control port in said housing by which connection of a source of pressurized hydraulic fluid to the lower port raises said piston from a lower position to an upper position and an upper control port by which connection of a source of pressurized hydraulic fluid to the upper port lowers said piston from an upper position to a lower position in said housing,

said outlet passage in said housing wall being closed off by the annular wall of the piston means when in said lower position and being open to the interior of the housing when in said upper position, and



hydraulic circuit means for connecting a source of pressurized hydraulic control fluid to said closing port of said blowout preventer thereby closing said blowout preventer while insuring that the outlet passage in said diverter housing remains closed off by said diverter piston wall,

or for connecting a source of pressurized hydraulic control fluid to said lower port in said diverter housing thereby raising said diverter piston from its lower position and opening said outlet passage and sequentially closing said blowout preventer.

4,546,829

ENHANCED OIL RECOVERY PROCESS

Alan B. Martin, Beattyville, and Ernest V. Jackson, Lexington, both of Ky., assignors to Mason & Hanger-Silas Mason Co., Inc., Lexington, Ky.

Continuation of Ser. No. 526,793, Aug. 26, 1983, abandoned, which is a division of Ser. No. 242,372, Mar. 10, 1981, Pat. No. 4,499,946. This application Feb. 11, 1985, Ser. No. 700,068

Int. Cl.[4] E21B *43/24, 43/34*

U.S. Cl. 166—267 **32 Claims**

1. A modular system for generating fluids at high temperatures and high pressures for selective injection into subterranean formations to enhance recovery of hydrocarbons and other fluids therefrom, comprising:

portable means defining a pressure-tight combustion reactor provided with burner means adapted to have fuel and air supplied under high pressure thereto for the creation of combustion gases at high temperatures and high pressures in said reactor;

portable means defining a steam boiler detachably connectable to said combustion reactor for the passage therethrough of, and heating thereof by, the high temperature high pressure combustion gases created in said combustion reactor to generate steam for selective injection into the formation with or alternatively to the gases, or for alternate use to produce power; and

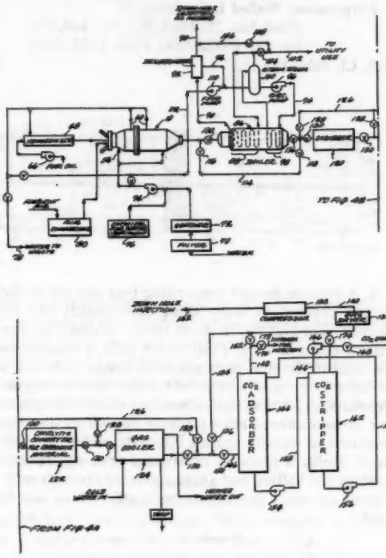
means connected to said reactor and to said boiler for selectively injecting into the formation such steam and gases separately or together.

14. A process for enhancing the recovery of hydrocarbons and other fluids from an underground formation, the steps comprising:

generating combustion gases at high pressures and high temperatures;

passing the gases through a heat exchanger type boiler to generate steam with the heat of the gases;

removing impurities from the gases leaving essentially only carbon dioxide and nitrogen;



selectively injecting the steam and/or at least a portion of the purified gases into the formation;

venting any remainder of the purified gases to atmosphere;

recovering liquid and gaseous hydrocarbons and gaseous impurities from the formation resulting from the injection;

separating the liquid and gaseous components of the recovery; and

burning at least one of the components to generate the combustion gases.

4,546,830

METHODS AND APPARATUS FOR RECOVERY OF HYDROCARBONS FROM UNDERGROUND WATER TABLES

Wayne C. McLaughlin, St. Charles; William J. Recker, Bloomingdale; Phillip C. Modesitt, Chicago, and Paul K. Francescon, Coal Valley, all of Ill., assignors to Pump Engineer Associates, Inc., Addison, Ill.

Division of Ser. No. 513,264, Jul. 13, 1983, Pat. No. 4,527,633. This application Dec. 20, 1984, Ser. No. 684,274

Int. Cl.[4] E21B *43/12, 44/16;* F04F *1/08*

U.S. Cl. 166—370 **4 Claims**

1. Apparatus for recovery of underground liquid from a well, said apparatus comprising:

a vessel having a liquid receiving chamber,

said vessel including a liquid inflow port at its lower end and liquid inflow permitting static pressure responsive check valve means for confining flow of the liquid through said inflow port to flow of same in an inflow direction into the vessel chamber,

said vessel including an outflow conduit therein defining a liquid outflow inlet port disposed adjacent and within the lower end of said chamber, said conduit including liquid outflow permitting, static pressure responsive check valve

means for confining flow of the liquid from said chamber through said outflow inlet port and said conduit to flow of same out of said chamber,

said conduit having an outlet adjacent to and exterior of the upper end of said vessel,

a source of gas under pressure,

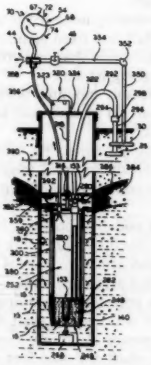
piping for conveying the liquid from the well,

said source of gas and said piping being located externally of the well and adjacent the ground surface level,

conduit means connecting said gas source to said vessel chamber and including fluid directional flow control valve means located exteriorly of the well including directional control means for venting said chamber to atmosphere therethrough and blocking off said gas source and forming the venting mode of said directional control valve means, and for communicating said gas source to said chamber free of venting of said chamber to the atmosphere and forming the chamber static pressurizing mode of said directional control valve means,

pipe means for connecting said conduit outlet to said piping with a corresponding liquid head,

means for suspending said vessel in the wells including means for adjusting said vessel vertically in the wells and for holding same essentially stationary vertically with said inflow port thereof in said liquid,



and means for switching said directional flow control valve means between said modes for establishing alternate vessel operation cycles of liquid inflow to said chamber with venting of said chamber to atmosphere, opening of said vessel inflow valve means under the static pressure of the liquid in the wells for flow of such liquid into said chamber, and closing of said vessel outflow check valve means under the head of said pipe means when such liquid is in said chamber, and gas pressurization of said chamber when such liquid is therein to evacuate the liquid therefrom into said piping through said vessel outflow valve means and said pipe means under the static pressure of said pressurized gas acting directly on the liquid in said chamber against said head of said pipe means and free of venting of said chamber to atmosphere and mechnical pumping of the liquid,

said switching means being exterior of the well and including means for selectively varying the time of operation of said operation cycles,

said vessel at its lower end being open to define said inflow port,

said inflow permitting check valve means being in said inflow port,

said liquid inflow check valve means comprising a pair of oppositely acting, upwardly directed, flapper members mounted for opposite free swinging movement about a common pivot axis adjacent the lower ends of same and extending crosswise of the direction of said inflow direction between a folded, substantially parallel, side by side inflow permitting relation in said vented mode of said directional control valve means, and an angled inflow checking relation in said chamber static pressurizing mode of said directional control valve means,

said liquid outflow check valve means comprising a pair of oppositely acting, upwardly directed, flapper members mounted for opposite free swinging movement about a common pivot axis adjacent the lower ends of same and extending crosswise of the direction of said outflow direction between a folded, substantially parallel, side by side outflow permitting relation in said chamber static pressurizing mode of said directional control valve means, and an angled outflow checking relation in said vented mode of said directional control valve means.

4,546,831

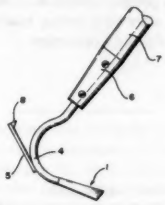
SIDEWALK AND CURB CREVICE WEEDER

Edward Albertson, 1070 W. Oceanview Ave., Norfolk, Va. 23503

Filed Aug. 10, 1983, Ser. No. 521,845

Int. Cl.[4] A01B *1/16, 1/20*

U.S. Cl. 172—13 **13 Claims**



9. A sidewalk and curb crevice weeder for removing undesirable growth occurring in cracks, crevices and expansion joints of sidewalks and sidewalk-curb interfaces, comprising:

a V-shaped cutting head at one end of a U-shaped rod, said V-shaped cutting head having a pointed base portion and two leg portions, each of said leg portions having first ends which are joined together to form said pointed base portion and second ends which are free ends, said second ends being further from the U-shaped rod than said pointed base portion, whereby said pointed base portion and two leg portions form a sharpened concave leading edge for catching and cutting undesirable growth therein, the pointed base portion of said V-shaped cutting head extending toward the exterior of the U-shaped rod; and

a second end of the U-shaped rod is connected to a handle by which the leading edge of the V-shaped cutting head may be drawn in and along cracks and crevices.

4,546,832

AGRICULTURAL IMPLEMENT WITH SPRING CUSHION FOR VERTICALLY ADJUSTABLE SUBFRAME

William J. Dietrich, Sr., Congerville, and Cary L. Sizelove, Eureka, both of Ill., assignors to DMI, Inc., Goodfield, Ill.

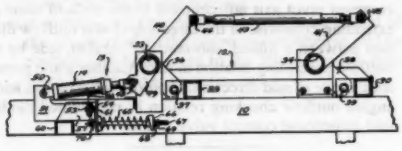
Filed Sep. 22, 1983, Ser. No. 534,564

Int. Cl.[4] A01B *61/00*

U.S. Cl. 172—260.5 **10 Claims**

1. In an agricultural implement including a main frame adapted to be pulled by a tractor; a first set of tillage tools carried by said main frame; support wheel means for supporting said main frame; a subframe carried by said main frame; a second set of tools mounted to said subframe; subframe lift mechanism including an hydraulic cylinder connecting said subframe to said main frame for adjusting the elevation of said subframe relative to said main frame while maintaining said

subframe generally parallel to said main frame, the improvement comprising: a spring cushion mechanism connected with said hydraulic cylinder between said main frame and subframe and including a spring, means for preloading said spring, a lever arm for compressing said spring when said second set of tools encounter an obstruction tending to lift said subframe, said spring compressing in response to said obstruction and



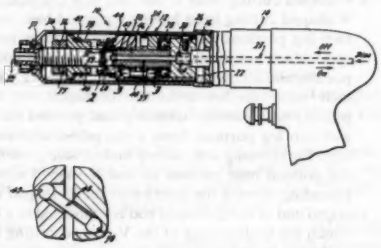
acting to reset said subframe to its adjusted working depth after said obstruction is passed, and pressure-actuated hydraulic bypass valve means actuated at a predetermined fluid pressure for communicating the rod end of said cylinder with said butt end thereof, in response to an upward force on said subframe greater than a predetermined amount for permitting said cylinder to extend after said spring cushion mechanism has reached the limits of design operation.

4,546,833

ADJUSTABLE TORQUE RESPONSIVE CONTROL

Imre Berecz, El Toro, and Dennis L. Hinton, Yorba Linda, both of Calif., assignors to Microdot Inc., Darien, Conn.

Filed Dec. 27, 1983, Ser. No. 565,232
Int. Cl.[4] B23Q *5/00*; F16D *11/04*
U.S. Cl. 173—12 **4 Claims**



1. A torque responsive control for a powered fastener driving tool, said tool comprising a motor, a reciprocable control rod for controlling the supply of power to said motor, and an output shaft rotatable by said motor, said torque responsive system comprising,

a rear ball pin retainer connected to the output shaft of said motor for rotation therewith,

a front ball pin retainer,

a plurality of ball pins extending between said front and rear ball pin retainers and movable between a circumferentially extending drive position and an axial shut down position,

a drive shaft driven by said front ball pin retainer,

a compression spring normally biasing said front ball pin retainer toward said rear ball pin retainer, and

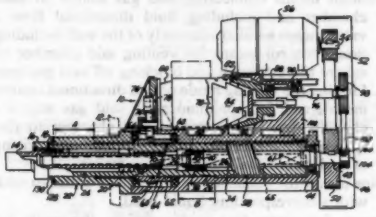
means controlled by said front ball pin retainer for controlling the axial position of said control rod.

4,546,834

MECHANICAL QUILL HAVING SELECTIVE BRAKING CAPABILITY

Klaus R. Menzel, Orchard Lake, Mich., assignor to The Cross Company, Fraser, Mich.

Continuation of Ser. No. 174,302, Jul. 3, 1980, abandoned. This application Sep. 30, 1983, Ser. No. 523,911
Int. Cl.[4] B23Q *5/40*
U.S. Cl. 173—146 **2 Claims**



1. A machining apparatus comprising:

a housing;

a hollow quill shaft;

a drive member rotatably mounted in said housing surrounding said quill shaft and fixed against axial movement;

means mounting said quill shaft in said housing for longitudinal movement along its axis;

a spindle shaft rotatably mounted within said quill shaft and adapted to be carried by said quill shaft with said longitudinal movement;

cam means drivingly connecting said quill shaft and said drive member producing said longitudinal movement of said quill shaft upon rotation of said drive member in said housing;

means for rotating said drive member including a first motor, a second motor having an armature and an armature shaft connected to said armature, means drivingly connecting said second motor armature shaft and said drive member, means drivingly connecting said first motor and said spindle shaft so that said spindle shaft is rotated by said first motor, clutch means drivingly connecting said second motor armature shaft and said first motor whenever said second motor is deenergized and disconnecting said second motor armature shaft and said first motor upon energization of said second motor, said clutch means including means mounting said armature and armature shaft to be axially movable towards and away from a first position, means urging said armature and armature shaft to said first position means causing movement of said armature and armature shaft away from said first position upon energization of said second motor against said urging; and also including respective first and second clutch members drivingly connected to said first motor and said armature shaft respectively having surfaces engaged when said armature and armature shaft are in said first position, whereby said first motor is adapted to rotate said spindle shaft and is also adapted to longitudinally advance said quill shaft by driving said drive member through said second motor armature shaft when said second motor is deenergized and further including;

means coupled to the housing for selectively decoupling the clutch surfaces drivingly connecting said second motor armature shaft and said first motor in response to a control signal, said means being operable independently of said energization of said second motor and comprising a movably mounted control member aligned opposite said second clutch member so as to move said second clutch member out of engagement with said first clutch member upon being axially shifted; and moving means for selectively axially shifting said control member into engagement with said second clutch member to move said second

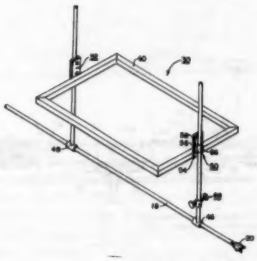
clutch member so as to disengage said surfaces on said first and second clutch members.

4,546,835

HORIZONTAL EARTH BORING DIRECTIONAL GUIDE

Carlton R. Williamson, 1117 Harrison, Hurst, Tex. 76053, and Fred M. Peterson, 3232 Shawnee Trail, Fort Worth, Tex. 76135

Filed Jun. 1, 1981, Ser. No. 268,772
Int. Cl.[4] E21B *47/022*
U.S. Cl. 175—40 **8 Claims**



1. In a machine having a drilling bit and drill stem for drilling a horizontal bore through earth formation while circulating drilling fluid through the stem and bit to flush cuttings back along the outside of the drill stem and out of the bore entrance, a directional guide for supporting the rotating drill stem near said bore entrance to cause said drill stem to extend into the drilled bore toward a designated target, said directional guide comprising:

(a) a base member adapted to extend horizontally across an earth trench and to be supported vertically by the earth surface disposed by the sides of said trench;

(b) first guide sleeve means for supporting said drill stem in journalled relation and extending into said trench below the base member from a first riser guide member rigidly connected to said guide sleeve means and adjustably connected to said base member; and

(c) first adjustment means for connecting said first riser guide member to said base member to adjustably position and to support said riser guide member including pivotable bracket means connecting and fixing a riser sleeve means at a designated angle with respect to said base member and riser clamping means fixing said riser guide member within said riser sleeve means to position said guide sleeve means at a designated distance and at a designated direction with respect to said base member.

4,546,836

DOWNHOLE MOTOR FLUID FLOW RESTRICTOR

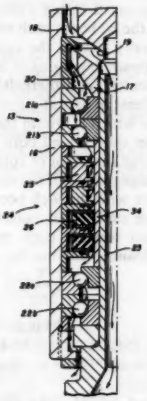
James G. Dennis, Pottsboro; Kenneth W. Bramlett, Arlington, and G. C. Jackson, Jr., Dallas, all of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 26, 1983, Ser. No. 545,794
Int. Cl.[4] E21B *4/02*
U.S. Cl. 175—107 **13 Claims**

1. A fluid flow restrictor system for limiting the fluid flow through an unsealed bearing housing of a drilling tool wherein the bearing housing is defined between an outer cylindrical member and a relatively rotatable inner cylindrical member, and bearing means disposed in said housing for rotatably supporting said cylindrical members and lubricated and flushed by said fluid flow therethrough, said system comprising:

restrictor means disposed in said bearing housing between said members to provide no load bearing support for said members and defining a variable area flow path for said fluid flow through said housing, said means responsive to increases in fluid pressure by decreasing said flow path area to maintain said fluid flow rate within a narrow range regardless of said fluid pressure, said restrictor means comprising:

a deformable member configured to define a fluid passage in flow communication with said fluid and said system further includes:



means for supporting said restrictor means against axial displacement due to increases in fluid pressure; and,

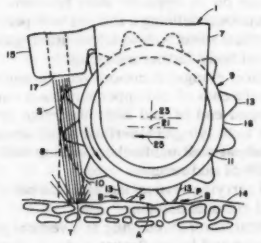
means for protecting the upstream surface of said deformable member from direct contact with high pressure abrasive drilling fluid.

4,546,837

DRILL BIT HAVING ANGLED NOZZLES FOR IMPROVED BIT AND WELL BORE CLEANING

John S. Childers, Greenville, and Paul E. Pastusek, Houston, both of Tex., assignors to Reed Tool Company, Houston, Tex.

Continuation-in-part of Ser. No. 437,927, Nov. 1, 1982, Pat. No. 4,516,642, which is a continuation-in-part of Ser. No. 132,950, Mar. 24, 1980, abandoned. This application Jun. 28, 1984, Ser. No. 625,495
The portion of the term of this patent subsequent to May 14, 2002, has been disclaimed.
Int. Cl.[4] E21B *10/18*
U.S. Cl. 175—340 **12 Claims**



1. A rotary drill bit for drilling a well bore, the bit comprising:

a bit body having a threaded pin at its upper end adapted to be detachably secured to a drill string for rotating the bit and delivering drilling fluid under pressure to the bit, a plurality of depending legs at its lower end, and nozzle means for exit of drilling fluid from the bit body; and

a plurality of roller cutters, one for each leg, each roller cutter comprising a generally conical cutter body rotatably mounted on the respective leg and a plurality of cutting elements on the cutter body, each cutting element at least at a portion of its surface being formed of a material resistant to erosion by high velocity drilling fluid which may impinge it;

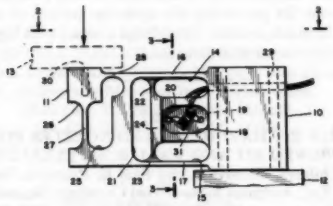
the nozzle means directing a plurality of streams of drilling fluid from the bit body, each stream being so directed as to flow generally toward the cutter body of a roller cutter, with the stream impinging at least one cutting element on the roller cutter, and thereafter impinging the well bore bottom at least in part at a generally triangular portion of the bottom which is within the vertical projection of the roller cutter on the well bore bottom and forward, with respect to the direction of rotation of the drill bit, of the points of engagement of the cutting elements of this latter roller cutter with the well bore bottom, whereby cutting elements on each roller cutter and portions of the well bore bottom beneath each roller cutter are subject to separate cleaning actions for enhanced drill bit cutting action.

4,546,838

FLEXURE ISOLATED SHEAR WEB LOAD CELL

A. Newman Ormond, 12020 E. Rivera Rd., Santa Fe Springs, Calif. 90670

Filed Jul. 23, 1984, Ser. No. 633,288
Int. Cl.[4] G01G *3/14, 21/12*
U.S. Cl. 177—211 **7 Claims**



1. A flexure isolated shear web load cell including a generally rectangular integral body having first and second ends for securement respectively to a stationary structure and a platform, said body having

(a) upper and lower symmetrical elongated cut-outs defining with the upper and lower exterior portions of said body load carrying horizontal arms, said body further having

(b) recesses on its opposite sides between said upper and lower cut-outs defining a thinned wall portion functioning as a vertical shear web to which strain gauges are attachable, said body further including

(c) a vertical elongated cut-out having opposite ends adjacent to the ends of said upper and lower cut-outs closest to the second end of said body to define upper and lower flexure webs lying in a vertical plane normal to the plane of said shear web and further defining with the near vertical walls of said recesses

(d) a load carrying vertical leg, and said body further including end cut-outs defining

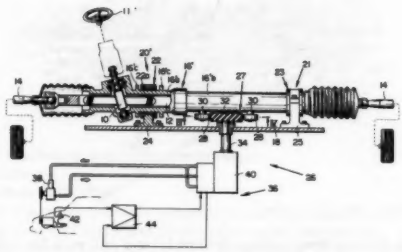
(e) a vertical flexure web lying in a vertical plane parallel to said upper and lower flexure webs in alignment with the point of securement of said second end of the body to a platform whereby a force applied by the platform is transmitted to said shear web by way of said upper and lower arms and said vertical leg, said vertical flexure web and upper and lower flexure webs isolating from said shear web extraneous moments caused by off-center loading of any platform to which said second end of the body is secured.

4,546,839

RACK AND PINION STEERING GEAR MOUNTING SYSTEM

Hiroshi Noguchi, Tochigi, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Jun. 4, 1984, Ser. No. 616,802
Claims priority, application Japan, Jul. 29, 1983, 58-119070[U]
Int. Cl.[4] B62D *5/06*
U.S. Cl. 180—142 **10 Claims**



1. A rack and pinion steering gear mounting system for a road vehicle, comprising:

a pinion rotatable with a manually operated steering wheel;

a rack gear meshed with said pinion for reciprocating motion longitudinally thereof for turning steerable vehicle wheels;

a gear housing enclosing movably therein and supporting said pinion and said rack and elongated axially of said rack gear;

a vehicle body member extending along said gear housing;

clamp means for mounting said gear housing on said vehicle body member in such a manner that the gear housing is limitedly movable longitudinally thereof relative to said vehicle body member;

insulator means interposed between said clamp means and said gear housing for damping of relative movements between said clamp means and said gear housing toward and away from each other;

variable-resilience stopper means for preventing longitudinal movement of said gear housing relative to said vehicle body member, said stopper means being rotatable to have, with respect to a force of the same magnitude applied thereto, such a variable resilience that is minimum at a predetermined position of said stopper means, reduces in accordance with rotary movement of said stopper means in a predetermined direction out of said predetermined position, and is maximum at 90° of rotary movement of said stopper means from said predetermined position; and

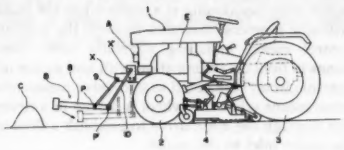
driving means for driving said stopper means in such a manner that said stopper means are held at or adjacent said predetermined position upon low-speed running conditions of the vehicle and rotated increasingly from said predetermined position as the speed of the vehicle increases and held at or adjacent 90° of rotary movement from said predetermined position upon high-speed running conditions.

4,546,840

TRAVELLING VEHICLE EQUIPPED WITH OBSTACLE DETECTOR SENSORS

Yoshifumi Yukishige; Kazuo Toyokuni, and Yoshizo Kuroiwa, all of Sakai, Japan, assignors to Kubota, Ltd., Japan

Filed May 12, 1983, Ser. No. 494,017
Claims priority, application Japan, Jun. 11, 1982, 57-101150
Int. Cl.[4] B60K *28/00, 41/02*
U.S. Cl. 180—169 **11 Claims**



1. A travelling vehicle equipped with obstacle detector sensors comprising:

a noncontact-type obstacle detector sensor;

a contact-type obstacle detector sensor including an electrically conductive rubber member having opposing faces, an electrically grounded metallic film covering one face of said rubber member, and an electrode plate having an electrode face in surface contact with another one of said faces of said rubber member; and

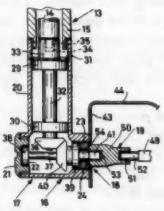
vehicle speed control means for automatically (a) reducing the vehicle speed from a preset vehicle speed (v_0) to a predetermined vehicle speed (v_1) when said noncontact-type obstacle detector sensor detects an obstacle, (b) resetting the vehicle speed to said present vehicle speed (v_0) when said noncontact-type obstacle detector sensor ceases detection of the obstacle and (c) stopping said vehicle immediately when said contact-type obstacle detector sensor detects the obstacle.

4,546,841

MOTOR ROLLER-SKATE

Michele Sipiano, Via Costantino, 22, 90147 Palermo, Italy

Filed Sep. 26, 1983, Ser. No. 535,623
Int. Cl.[4] B60K *17/04*
U.S. Cl. 180—181 **2 Claims**



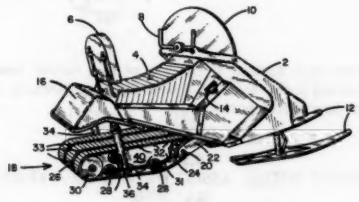
1. A motorized roller-skate comprising a pair of drive wheels mounted on a rotatable drive shaft, a motor system including a power unit mounted on a frame which can be tied as a kit-bag to the body of the roller-skater and a flexible connection comprising a rotatable flexible shaft within an outer housing for driving the drive shaft, the flexible connection being connected to an L-shaped housing, the L-shaped housing containing a conical gear transmission having a rotatable driving element disposed at a right angle to the flexible shaft and capable of releasably engaging the drive shaft, the L-shaped housing having a releasable connection for connecting to the side of the roller skate, the releasable connection including a first bracket on the L-shaped housing having a plurality of connection pins with enlarged heads, the roller skate having a second bracket disposed around the drive shaft and having a plurality of eyelets capable of releasably receiving the connection pins, upon rotation of the first bracket relative to the second bracket, for attaching the first bracket to the second bracket and the drive element to the drive shaft, the L-shaped housing further comprising a reciprocating locking pin receivable in a hole in the second bracket thereby resisting rotation of the L-shaped housing to the second bracket.

4,546,842

SLIDE RAIL TRACK DRIVE SYSTEM FOR A SNOWMOBILE

Toshihiro Yasui, Coon Rapids, Minn., assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan

Filed May 27, 1983, Ser. No. 498,831
Int. Cl.[4] B62D *55/24;* B62M *27/02*
U.S. Cl. 180—193 **6 Claims**



1. An improved track suspension system for a snowmobile including an endless drive track suspended from a snowmobile chassis, the improvement comprising:

(a) a hollow enclosure mounted interiorly of said endless drive track having top, bottom and end outer surface contours substantially coextensive with said endless drive track so as to occupy substantially all of the interior space thereof and having right and left exposed sides, the edges of which sides each include a slide rail mounted to a portion thereof for each engaging a mating smooth interior surface of said track;

(b) at least one driven sprocket mounted to the side of said enclosure in drive engaging relation to said track whereby motive power is supplied to said track;

(c) a plurality of idler wheels mounted to the sides of said enclosure for engaging smooth lateral interior surfaces of said track and supporting and guiding said track in relation to said enclosure and slide rails;

(d) pneumatic shock absorbing means coupled to one end of said enclosure and to said chassis; and

(e) whereby in combination said improved track suspension system resiliently supports the snowmobile chassis above a substantially snow and ice free endless drive track.

4,546,843

COOLING SYSTEM

Yutaka Koinuma; Yasuo Ikenoya, both of Saitama, and Akira Hayashi, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 31, 1983, Ser. No. 528,365
Claims priority, application Japan, Sep. 20, 1982, 57-142471[U]
Int. Cl.[4] B60K *11/06*
U.S. Cl. 180—229 **3 Claims**

3. A motorized cycle, comprising

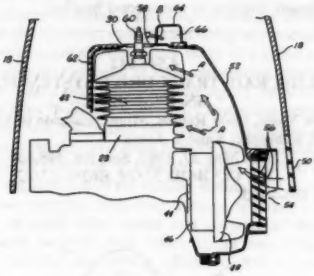
a body;

a body cover;

an air cooled engine mounted within said body cover and having a cylinder head, an air cleaner intake port, and a crankshaft extension;

a fan fixed to said crankshaft extension for rotation therewith;

a shroud fixed to said engine surrounding said cylinder head and said shroud having a hole at the top of the cylinder head; and



a vent hole formed at the top of said shroud beside said shroud hole, said vent hole opening towards said air cleaner intake port.

4,546,844

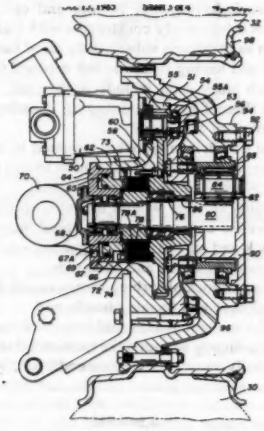
FRONT WHEEL ASSIST DRIVE FOR A VEHICLE MACHINE

Robert E. Stauffer, Bucyrus, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 3, 1985, Ser. No. 471,586

Int. Cl.[4] **B60K** *7/00;* **F16H** *1/28, 47/00;* **F16D** *21/08*

U.S. Cl. 180—243 **14 Claims**



5. A front wheel assist drive for a vehicle having a rear wheel main drive comprising:

a fluid pump;

conduit means connected to the inlet and outlet of said pump for respectively delivering fluid to and from said pump;

a hydraulic motor having an inlet and an outlet connected through said conduit means to said pump outlet and inlet, said motor having an output shaft including a gear attached thereto;

an input mesh gear in driving engagement with said motor gear;

an output shaft, including a sun gear, said shaft being connected to said input mesh gear;

an overrunning clutch interposed between said input mesh gear and said output shaft for selectively connecting said shaft through said input mesh gear to said motor when the motor is turning in a first direction;

a ring gear having internal teeth disposed concentrically about said sun gear;

a planetary gear set interposed between said sun and ring gears and being in driving engagement with said sun gear;

means in driven engagement with said planetary gear set and connected to said front wheel for driving said wheel in a first direction; and

control means connected to said motor for preventing the motor from functioning as a pump when the front wheel is driven in a reverse direction through the main drive, said control means including normally close check valve means in fluid communication with said motor inlet; and a control circuit connected to said valve means to open said valve means when the wheel is driven in a reverse direction through the main drive to establish a flow path from the motor inlet to the outlet.

4,546,845

ELECTROPNEUMATIC DOOR CONTROL

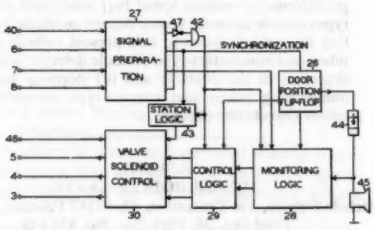
Dietmar Meyer, and Horst Scheibe, both of Barsinghausen, Fed. Rep. of Germany, assignors to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Nov. 15, 1982, Ser. No. 441,455

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1981, 3124398

Int. Cl.[4] **E05F** *15/20;* **F15B** *15/20*

U.S. Cl. 180—286 **2 Claims**



1. Electropneumatic door control apparatus for controlling opening and closing movements of a vehicle door which provides entry and exit for passengers, comprising,

(a) fluid pressure operable controller means connected to said vehicle door and responsive to selectively supplied fluid pressure for alternately opening and closing said door,

(b) a source of pressurized fluid,

(c) valve means coupled to said source and said controller means and responsive to selective signals for supplying pressurized fluid to actuate said controller means to open and close said door,

(d) an electronic circuit means coupled to receive door movement request signals and door response signals and responsive for processing the received signals and supplying selective signals to said valve means to actuate the requested door movements,

(e) a logic network coupled to receive a current vehicle speed signal generatd by a sensor located on said vehicle and a door command signal and operable for enabling said electronic means to supply an open door command signal to said valve means only when said vehicle speed is less than a predetermined safe level,

(f) said logic network having a NAND gate means coupled to receive door movement request signals and said vehicle speed signal for supplying a request signal to said electronic circuit means only when vehicle speed is less htan said predetermined safe level,

(g) a parking brake control means coupled to respond to said

open door command signal from said logic network and to a door not closed signal from said electronic circuit means for assuring vehicle brake action to hold said vehicle halted while said door is open,

(h) said praking brake control means having station logic means coupled to said electronic circuit means and responsive to sequential open door request signal and a door open indication signal for supplying a brake signal, and

(i) brake control means coupled to said station logic means and responsive to a brake signal for assuring the continued application of vehicle brakes while the vehicle remains halted and said door open.

4,546,846

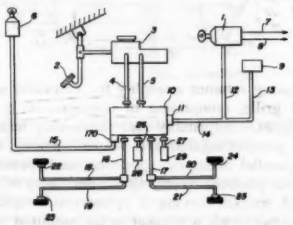
SAFE LOCK ANTI-THEFT HYDRAULIC BRAKE CONTROL SYSTEM

Ronald L. Myers, 2 Westport, Irvine, Calif. 92714

Filed Apr. 19, 1984, Ser. No. 601,975

Int. Cl.[4] B60R *25/00*

U.S. Cl. 180—287 **11 Claims**



2. A safe lock anti-theft hydraulic brake control system, as recited in claim No. 1, in which said manually operated arming and de-arming system further comprises:

(a) A manually driven key switch;

(b) An electrically isolated cable connected on one end to said key switch mechanism and on the other end to an electrical isolation end cap of an activation piston assembly in said brake hydraulic fluid control member;

(c) An electrically interior and external insulated metal sheath cable assembly in which is housed said electrically isolated cable;

(d) An insulated electrical power supply lead connected to said insulated metal sheath of said cable assembly;

(e) An insulated electrical lead connected to said electrically isolated cable, the function of such electrical lead being to provide closure of an external alarm circuit if said metal sheath cable assembly is destructively tampered with;

(f) A means suitable for attaching said electrically isolated cable to said key switch;

(g) A means suitable for attaching said electrically isolated cable to said electrical isolation end cap;

(h) A means suitable for attaching said electrical power supply lead to said metal sheath;

(i) A means suitable for attaching electrically insulated lead to said electrically isolated cable.

4,546,847

HYDROSTATIC-TRANSMISSION CONTROL SYSTEM, ESPECIALLY FOR LIFT AND OTHER INDUSTRIAL VEHICLES

Theodor Abels, Aschaffenburg-Nilkheim, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Hollriegelskreuth, Fed. Rep. of Germany

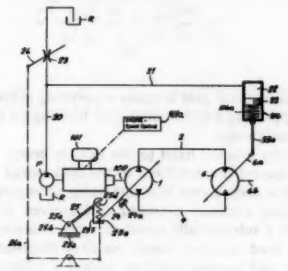
Division of Ser. No. 129,258, Mar. 11, 1980, abandoned, which is a continuation of Ser. No. 863,622, Dec. 23, 1977, Pat. No. 4,236,596, which is a continuation-in-part of Ser. No. 688,774, May 21, 1976, Pat. No. 4,108,265. This application Mar. 5, 1982, Ser. No. 355,302

Claims priority, application Fed. Rep. of Germany, May 22, 1975, 2522719

The portion of the term of this patent subsequent to Dec. 2, 1997, has been disclaimed.

Int. Cl.[4] B60K *17/10*

U.S. Cl. 180—307 **2 Claims**



1. A vehicle-drive system comprising:

an engine;

a wheel means for propelling a vehicle;

a hydrostatic transmission having a variable-displacement pump formed with an input shaft connected to said engine, a pump-control element for varying the displacement of said pump, and at least one variable-displacement motor hydraulically connected to said pump and formed with at least one output shaft connected to said wheel means, said transmission having a variable-speed ratio between said input shaft and said output shaft, and a motor-control element for controlling the displacement per revolution of said motor;

an operator-controlled actuating member; and

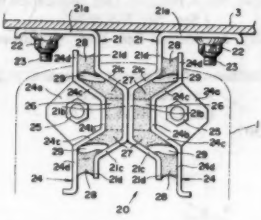
control means directly and mechanically connecting said member with said pump-control element and hydraulically connecting said member with said motor-control element so that said actuating member, after initially exclusively moving said pump control element then effects hydraulic supply to said motor control element whereby said actuating member is effective at low to average speeds of said output shaft for establishing said ratio solely as a function of the position of said member by exclusively displacing the pump-control element and at higher speeds of said output shaft varying said ratio independently of the displacement of said pump-control element as a function of the rotary speed of said input shaft, the control means and tranmission being constructed and arranged so that said motor-control element is displaced when said pump-control element is in a position corresponding to maximum displacement per revolution of said pump whereby said pump-control element is displaced solely by operator control and said pump-control element and said motor-control element are effectively decoupled in said position of said pump-control element, means being provided whereby engine speed can affect said ratio by increasing hydraulic supply to said motor control element due to back pressure.

4,546,848

DIFFERENTIAL GEAR HOUSING SUPPORTING APPARATUS

Yoshitaka Iijima, Atsugi; Takaaki Uno, Zama, and Mitsuru Watanabe, Inuyama, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Nov. 14, 1983, Ser. No. 551,461
Int. Cl.[4] B62D *25/00*
U.S. Cl. 180—312 **8 Claims**



1. A differential gear housing supporting apparatus for elastically supporting a differential gear housing on a vehicle body, which comprises:

(a) a first bracket fixed to the vehicle body;

(b) a second bracket fixed to the differential gear housing;

said first and second brackets being arranged vertically and having concave outward and convex inward portions with a substantially constant space therebetween;

(c) at least one first elastic member disposed between said first and second brackets within a substantially vertical portion of the space, said first elastic member deforming in shear mode when the differential gear housing vibrates up and down or back and forth relative to the vehicle body; and

(d) a pair of second elastic members disposed between said first and second brackets respectively above and below a first member in an inclined portion of the space, said second elastic members deforming in both shear and compression modes during both up and down portions of vibrations when the differential gear housing vibrates up and down and in only shear mode when the differential gear housing vibrates back and forth, the deformation mode of said second elastic member changing gradually from shear mode to compression mode with increasing displacement thereof.

4,546,849

MACHINE OPERATORS COMPARTMENT

Barry R. Kelley, Ashland; Maurice K. LeBegue, Argillite, both of Ky., and Earl C. Michael, Hoyleton, Ill., assignors to National Mine Service Company, Pittsburgh, Pa.

Filed Apr. 23, 1984, Ser. No. 603,105
Int. Cl.[4] E21D *19/00*
U.S. Cl. 180—326 **20 Claims**

1. An operator's compartment for a mobile machine comprising,

a machine frame,

a support structure positioned adjacent to said machine frame,

said support structure including a base connected to said machine frame,

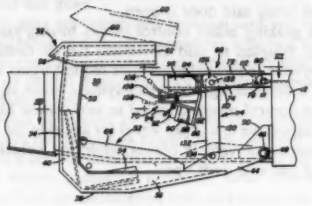
an operator's platform for a machine operator positioned on said base,

a protective canopy overlying said operator's platform and movably connected to said machine frame for height adjustment relative to said operator's platform,

a control panel including means for controlling operation of the mobile machine,

said control panel being connected to said protective canopy and extending downwardly therefrom, and

means for supporting said protective canopy in a preselected position relative to said operator's platform for locating



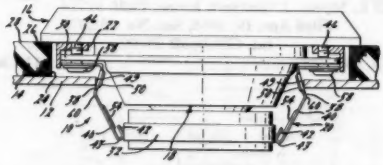
said control panel at a desired elevation for a machine operator.

4,546,850

SPEAKER AND GRILLE INSTALLATION CLIP MOUNTING

Richard C. Litner, Milford, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 12, 1984, Ser. No. 588,475
Int. Cl.[4] H04R *1/02*
U.S. Cl. 181—141 **2 Claims**



1. A mounting retainer assembly for vehicular cylindrical speaker and grille, comprising in combination; a generally cylindrical speaker adjustably and removably installed in a vehicle base panel elongated oval-shaped opening, said opening having parallel linear side portions, said speaker formed with lateral ear portions overlying the periphery of said panel opening, said speaker having a cylindrical magnet portion adjacent its lower end, a speaker grille mounted above said base panel and spaced a predetermined distance therefrom by an intermediate resilient pad, said pad provided with a similarly shaped opening of larger extent substantially paralleling the perimeter of said panel opening, a pair of diametrically opposed generally Z-shaped resilient spring clips, each said clip having a horizontally disposed mounting flange fixedly secured by a fastener to the underside of said grille, each said clip flange deformably joined at its inner end with a downwardly and outwardly diverging shoulder portion, said shoulder portion in its unflexed pre-installed mode forming an included acute angle with said flange, said shoulder portion in turn deformably joined at its lower end with a downwardly and inwardly converging arm portion forming an included obtuse angle with said shoulder portion, said arm portion terminating at its free end in a radiused inwardly directed return bend finger portion, an intermediate portion of each said clip shoulder portion having integral L-shaped wing portions extending laterally therefrom facilitating installation and removal of each said clip in said opening while providing increased spring stiffness thereof relative to its arm portion, each said shoulder and arm portion being resiliently collapsible inwardly away from each other permitting passage of each said clip shoulder and arm portions through said panel opening linear side portions during installation or removal of said speaker and grille assembly, each said installed clip shoulder portion resiliently contacting the bottom edge of its associated panel opening linear side portion while its associated finger

portion is spring biased radially inwardly so as to resiliently engage said speaker magnet portion, each said clip shoulder portion adapted to be slid laterally on its associated panel opening linear side portion bottom edge, such that said speaker and grille assembly is adjustably movable laterally relative to said panel opening allowing ready tolerance adjustment of said assembly, wherein said resilient pad is compressed between said grille and said panel by said pair of clips, whereby each said finger portion operative for smooth axial sliding movement on said magnet portion providng a speaker and grille assembly vibration and shock dampening adjustable mounting.

4,546,851

TREE CLIMBING APPARATUS

Daniel F. Brennan, 512 Main St., Shoemakersville, Pa. 19555

Filed Nov. 3, 1982, Ser. No. 438,942
Int. Cl.[4] A62B *1/16, 35/00*
U.S. Cl. 182—7 **17 Claims**

1. Tree climbing apparatus for enabling a person to climb a tree, and descend from the tree comprising:

a. a suspension rope,

b. seat means connected to said suspension rope adjacent an end thereof,

c. unidirectional cleat means engaging said suspension rope remote from said end thereof for permitting movement of said rope in said cleat means only in the direction to enable the rope to be shortened between said seat means and cleat means, said cleat means comprising a body and rope-engaging dogs, upwardly facing hook means on said body,

d. link means between said seat means and said body of said cleat means for suspending weight on said seat means through said body of said cleat means to the suspension rope, said link means extending between said hook means and said seat means.

4,546,852

ADJUSTABLE SERVICE PLATFORM APPARATUS FOR A GANTRY CRANE

John F. Martin, Ocean Springs, and Charles H. Zweifel, Biloxi, both of Miss., assignors to Fruehauf Corporation, Gulfport, Miss.

Filed Feb. 7, 1984, Ser. No. 577,676
Int. Cl.[4] E04G *3/10*
U.S. Cl. 182—12 **9 Claims**

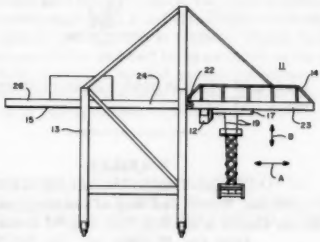
7. A service platform apparatus for a gantry crane having a crane support structure, a horizontal boom structure and gantry, a trolley moveable on said boom and gantry, lifting ropes depending from said trolley and actuated by crane mounted hoist machinery, and a headblock reeved to the lower ends of said lifting ropes, said service platform apparatus comprising

a base frame adapted to be releasably secured to said headblock,

a counterweight suspended below said base frame for stabilization,

a pair of mirror image twin work platforms mounted above said base frame on integrated structures including a pair of tower frames adapted to be assembled over and secured to opposite lateral ends of the base frame on opposite sides of the attachment of the headblock to the base frame, a sliding carriage frame and drive means for laterally extending and retracting same secured to the top of each of said tower frames, scissors lifts supported on each of said sliding carriage frames, said work platforms being supported on the top of said scissors lifts,

a multiplicity of horizontal retractable extensions mounted on said platforms to provide additional floor work-space to said platforms,



remote control means on said platforms for permitting an operator on a particular work platform to independently control the raising and lowering of that platform and the laterally traversing of said base frame by said platform, said control means including a manual crane lockout switch within reach of the operator for interrupting any hoist or trolley movement of said crane,

means for interlocking the trolley and hoist controls of said crane with the position of said work platform whereby full speed operation of the hoisting and trolley functions of the crane are restricted whenever a work platform is displaced from a predetermined position relative to the base frame and whereby hoist and trolley motions are prevented for any position of a work platform which would permit it to hit or interfere with the crane support structure when moved.

4,546,853

PORTABLE FOLDING PLATFORM APPARATUS USED WITH A LADDER AND WINCH

Theodore F. Hanson, 1726 E. Yale, Phoenix, Ariz. 85006

Filed Jul. 2, 1984, Ser. No. 627,185
Int. Cl.[4] B66B *9/20;* **E06C** *7/12*
U.S. Cl. 182—103 **23 Claims**

1. A portable folding platform apparatus for lifting a load and for use preferably with a ladder and winch, comprising:

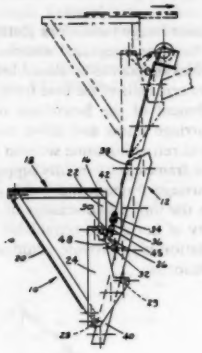
platform means for holding said load;

strut means operably coupled to said platform means for supporting said platform means;

side plate means operably coupled to said strut means for operably guiding and moving said apparatus up and down said ladder; and

swing arm means rotatably coupled to said strut means and

said side plate means for operably engaging the upper surfaces of said ladder and operably coupling said apparatus to said winch in order to move said apparatus up and down said ladder.



4,546,854

LOAD-CARRYING PLATFORM

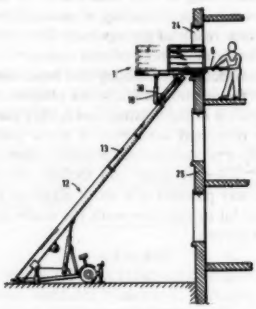
Albert Böcker, Werne, Fed. Rep. of Germany, assignor to Albert Böcker GmbH & Co. KG, Fed. Rep. of Germany

Filed Jun. 10, 1983, Ser. No. 503,289

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222509

Int. Cl.⁴ E06C *7/12*; B66B *9/00*

U.S. Cl. 182—103 **3 Claims**



1. In an inclined elevator having a plurality of telescopic elevator sections, each sections having guide rails, a carriage arranged to move thereon, a platform supported on the carriage, and guides for defining a path on the carriage over which the platform may travel, said guide comprising:

a first guide rail depending from each side of the platform,

a second guide rail mounted above each side of the carriage disposed outside said first guide rails,

said first rails each having a lower horizontal flange extending toward the adjourning second rail,

said second rails each having upper and lower horizontal flanges extending inwardly,

a third rail disposed between each set of first and second rails, said rails being of box-shaped cross section with vertical sides one of which is provided with a transverse slot,

the horizontal flange of one of the guide rails extending into said slot,

bearings extending between the vertical sides of each third rail, each bearing having a roller mounted thereon,

said bearings serving to reinforce the sides of said third rail as well as to support said rollers,

one of said bearing being disposed above said slot and another below said slot,

the rollers on said bearings being arranged to roll on the tracks provided by the horizontal flange of the rail extending through said slot and the flange of the other rail disposed beneath the lower of said rollers, the horizontal flange on the rail extending into said slot having a down turned terminal flange arranged between the lower roller and the remote vertical side of the third rail and the lower horizontal flange of the second rail having an upturned terminal flange extending above the bottom of the third rail whereby lateral movement of the third rail between the first and second rails is restricted and said first and second rails are stiffened by the provision of such terminal flanges.

4,546,855

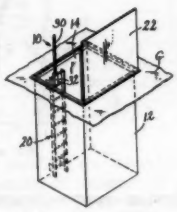
SAFETY EXTENSION FOR A FIXED LADDER WITH AN ADJUSTABLE MOUNT

Robert J. Lyons, Hamden, Conn., assignor to The Bilco Company, New Haven, Conn.

Continuation-in-part of Ser. No. 308,946, Oct. 5, 1981, abandoned. This application Aug. 9, 1982, Ser. No. 406,359

Int. Cl.⁴ E06C *5/36, 7/18*

U.S. Cl. 182—106 **19 Claims**



1. A safety extension for mounting on a wall or ladder comprising:

a sleeve;

an extension rod slidably mounted within said sleeve;

adjustable mounting means secured to said sleeve for attaching said sleeve to said wall or said ladder;

sleeve latch means for non-rotatably securing said extension rod within said sleeve in an extended position;

release means cooperatively attached to said latch means to allow disengagement of said latch and the movement of said extension rod from said extended position to a retracted position; and

counterbalance means for facilitating the movement of said rod from said retracted to said extended position relative to said sleeve.

4,546,856

FENDER BEAM AND LIFE LADDER IN ONE

Masatoshi Nagao, Kobe, Japan, assignor to Sumitomo Gomu Kogyo Kabushiki Kaisha, Hyogo, Japan

Filed Aug. 13, 1982, Ser. No. 407,912

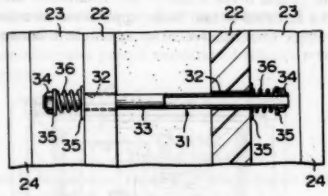
Claims priority, application Japan, Aug. 15, 1981, 56-121493[U]

Int. Cl.⁴ E06C *9/00*; B63B *21/00*

U.S. Cl. 182—228 **4 Claims**

1. A combined fender and life ladder assembly mountable in use on a sidewall of a shore installation, the assembly comprising: a pair of elongate elastic plate-like members mountable in spaced apart side-by-side relation, each plate-like member

having a mounting flange portion extending lengthwise thereof for mounting the plate-like member on a sidewall of a shore installation during use of the assembly, a buffer block portion extending lengthwise of the plate-like member and having a freely exposed lengthwise extending outermost surface, and a body portion extending lengthwise of the plate-like member and being connected along the length thereof at one widthwise end to the mounting flange portion and being connected along the length thereof at the other widthwise end to the buffer block portion, the two body portions extending obliquely outwardly in converging directions from their respective mounting flange portions so that the two buffer block portions lie in juxtaposed spaced-apart relation a smaller distance apart than the two mounting flange portions; and a plurality of rung



members connected crosswise to the two spaced-apart buffer block portions in spaced relation along the length thereof, the two buffer block portions having pairs of aligned openings through which extend the opposite end portions of respective ones of the rung members, the rung member end portions projecting outwardly beyond the buffer block portions, biasing means comprising a coil spring disposed over each of the projecting opposite end portions of the rung members for biasing the opposite end portions of each rung member in opposite axial directions, and each rung member having opposite end portions connected to respective ones of the two buffer block portions at locations inwardly spaced from the freely exposed outermost surfaces thereof thereby protecting the rung members and enabling them to be used as the rungs of a life ladder.

4,546,857

CONVEYOR SYSTEM FOR A DRIVE-IN BANK

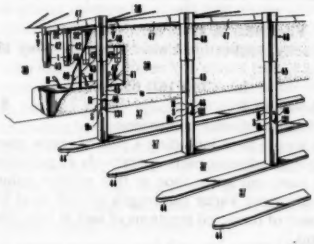
Takaaki Hamada, Kure; Yohji Kobayakawa, Hiroshima; Akira Nishikawa, Hiroshima, and Manabu Kawahara, Hiroshima, all of Japan, assignors to Kumahira Safe Co., Inc., Hiroshima, Japan

Filed Jan. 20, 1984, Ser. No. 572,454

Claims priority, application Japan, Jul. 21, 1983, 58-131982; Jul. 21, 1983, 58-131983; Jul. 21, 1983, 58-131984; Jul. 21, 1983, 58-131985; Jul. 21, 1983, 58-131986; Jul. 21, 1983, 58-131987; Jul. 21, 1983, 58-131988

Int. Cl.[4] E04H *3/04*

U.S. Cl. 186—37 **13 Claims**



1. In a conveyor system for a drive-in bank of the type including first delivering and receiving stations, a plurality of first vertical hollow columns standing upright on said first delivering and receiving stations, second delivering and receiving stations, a plurality of second vertical hollow columns standing upright on said second delivering and receiving stations, a plurality of horizontally extending hollow beams to connect both the first and second vertical hollow columns to one another at their top ends, conveyance means for conveying a deposit box in both directions through the first vertical hollow column, the horizontally extending hollow beam and the second vertical hollow column and vise versa and driving means for driving said conveyance means in the specified direction, the improvement consisting in that the conveyance means essentially comprises guide members having arcuate bent portions at junctions between the first vertical hollow column and the horizontally extending hollow beam as well as between the second vertical hollow column and the horizontally extending hollow beam, an opposing pair of endless conveyance belts extending along said guide members to resiliently contact and hold a deposit box in the space as defined by said endless conveyance belts, a cart removably containing the deposit box therein which cart is in resilient contact with the endless conveyance belts, said cart being movable on the guide members in both directions by said endless conveyance belts and stopper means disposed at both the end parts of the guide members so as to inhibit further movement of the cart.

4,546,858

BICYCLE BRAKE HAVING AN IMPROVED ADJUSTMENT MECHANISM FOR ADJUSTING THE POSITION OF A BRAKE SHOE RELATIVE TO A WHEEL RIM

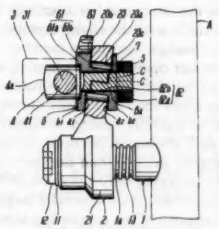
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Nov. 2, 1983, Ser. No. 548,085

Claims priority, application Japan, Nov. 6, 1982, 57-168562[U]; Nov. 6, 1982, 57-168563[U]; Jul. 6, 1983, 58-105658[U]

Int. Cl.[4] B62L *1/14*

U.S. Cl. 188—24.19 **8 Claims**



1. A brake for a bicycle comprising a pair of bases, each base being fixed to a frame of said bicycle and having a lever shaft; a pair of arms, each supported swingably to a said lever shaft at a said base and each having a pivot portion and a shoe mounting portion; a pair of brake shoes, each brake shoe being fixed to a said shoe mounting portion and having a mounting pin; a pair of fixing bolts, each bolt fixing a said mounting pin to a said arm and each bolt having a head, and a pair of nuts, each nut screwing with a said bolt, so that said brake shoes can be brought into contact with a wheel rim of the bicycle to thereby exert a braking action on said rim; and adjusting means for adjusting positions of said brake shoes with respect to said wheel rim, said adjusting means including a pair of adjusting mechanisms, each adjusting mechanism having a pair of inner surfaces substantially parallel to outside surfaces of a said shoe mounting portion and a pair of outer surfaces inclined with respect to said outside surfaces, said outer surfaces being parallel to each other, each said adjusting mechanism further having an insertion bore for a said bolt, said insertion bore being substantially perpendicular to said outer surfaces, said adjust-

ing mechanisms each being supported rotatably with respect to a said arm, each said adjusting mechanism comprising a pair of first and second members, each first and second member having a said inner surface and a said outer surface, at least one of said first and second members having a cylindrical portion projecting substantially perpendicularly to said inner surfaces of each of said first and second members, a center bore of said cylindrical portion being in continuation of and coinciding with a said insertion bore for a said bolt which is substantially perpendicular to said outer surfaces of each of said first and second members.

4,546,859

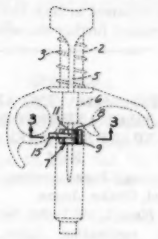
ADJUSTABLE STOP FOR DISPENSING SYRINGE

Howard F. Newman, Los Angeles, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Continuation of Ser. No. 17,662, Mar. 5, 1979, abandoned, which is a division of Ser. No. 836,995, Sep. 27, 1977, Pat. No. 4,173,225. This application Nov. 10, 1980, Ser. No. 205,117

Int. Cl.⁴ B65H *59/10*; **B23B** *45/14, 49/00*

U.S. Cl. 188—67 **6 Claims**



1. An adjustable stop for gripping a rod at selected locations intermittent the length of the rod, comprising: a base member with a pair of longitudinally spaced openings for receiving a rod with a longitudinal axis; a clamp member with an opening located between the base member openings for receiving the same rod; a cam surface on the clamp member for engaging the base member to misalign the clamp member opening between the two base member openings for gripping such rod with the three openings as the clamp member is rotated about the rod's longitudinal axis when the rod extends through the adjustable stop; and a pair of laterally spaced abutment portions on the base member, said abutment portions being separated by a distance substantially greater than the rod's transverse dimension for slidingly engaging only a portion of the periphery of a supporting structure that is substantially larger than the rod so that remaining portions of the supporting structure remain free for performing other functions as the stop moves relative to the supporting structure in a direction generally parallel to the rod's longitudinal axis as the abutment portions limit rotational movement of the stop during longitudinal adjustment.

4,546,860

BRAKE ACTUATOR DEVICE WITH AUTOMATIC SLACK ADJUSTER

Joachim Feldman, Neustadt, and Andreas Oberländer, Hanover, both of Fed. Rep. of Germany, assignors to Wabco Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Division of Ser. No. 297,478, Aug. 28, 1981, Pat. No. 4,461,371. This application Feb. 23, 1984, Ser. No. 582,974

Claims priority, application Fed. Rep. of Germany, Aug. 30, 1980, 3032828

Int. Cl.⁴ F16D *65/52*

U.S. Cl. 188—71.4 **4 Claims**

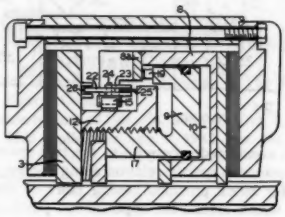
1. A brake device including at least one disc member that is connected to the axle of a vehicle wheel for rotation therewith and at least one brake member having friction linings axially movable into and out of engagement with said at least one disc member, said brake device comprising:

(a) a brake actuator movable in a brake application direction in response to the supply of fluid under pressure thereto to force said at least one brake member toward engagement with said at least one disc member;

(b) expansion means for taking up slack between said at least one brake member and said at least one disc member due to wear of said friction linings comprising:

(i) a sleeve between said brake actuator and said at least one brake member, said sleeve being threadedly connected to said brake actuator so as to be axially adjustable relative thereto;

(ii) a transfer means interposed between said brake actuator and said brake member for converting axial movement of said brake actuator into rotation of said sleeve when actuated in said brake application direction so as to effect said relative axial adjustment between said



brake actuator and said sleeve, said transfer means comprising:

(a) a toggle lever having a first lever arm with a roller at one end thereof engageable with said brake actuator and a second lever arm pivotally connected at one end thereof to said brake member, said first and second levers being pivotally connected to each other at their respective other ends; and

(iii) a tension band surrounding said threaded sleeve to provide frictional engagement therewith when said brake actuator is actuated in said brake application direction and to release said frictional engagement when said brake actuator is moved in the opposite direction, said tension band being fixed at one end thereof to the other ends of said first and second lever arms of said toggle lever; and

(iv) a spring connected between the other end of said tension band and said toggle lever so as to maintain said tension band in a prestressed condition.

4,546,861

AUTOMATIC ADJUSTER FOR SHOE-DRUM BRAKE

Timothy J. Martin, Solihull; Bernard T. Page, Shirley, and Francis H. A. Hooper, Coventry, all of England, assignors to Lucas Industries Public Limited Company, Birmingham, England

Filed May 9, 1983, Ser. No. 492,608

Claims priority, application United Kingdom, May 17, 1982, 8214305

Int. Cl.⁴ F16D *65/56*

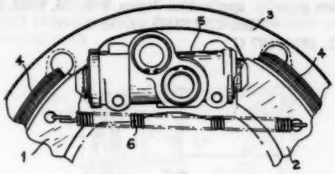
U.S. Cl. 188—79.5 GE **5 Claims**

1. An automatic adjuster comprising:

a variable length strut including a pair of screw threadedly interengaged adjuster parts operatively engageable in use with at least one brake shoe so that relative rotation between said parts varies the length of said strut to effect adjustment of retracted positions of said at least one brake shoe; and

restraint pins respectively projecting axially from said parts in opposite directions and having circumferentially facing portions and lengths in relation to the pitch of the interen-

gaged screw threads of said parts so that said circumferentially facing portions are engageable in mutual abutting relationship to prevent relative rotation in one direction of said parts when said parts are near an extremity of adjusting movement to preclude engagement of a surface of at least one of said parts with an adjacent opposed surface, but otherwise permit unrestricted relative rotation of said parts.

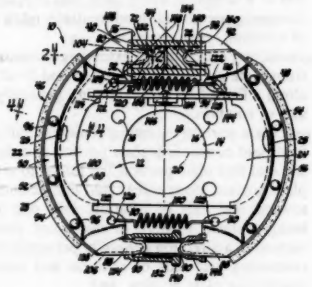


4,546,862

DRUM BRAKE

Ronald L. Shellhause, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 5, 1983, Ser. No. 539,273
Int. Cl.⁴ F16D *51/20*
U.S. Cl. 188—331 **2 Claims**



1. A drum brake shoe assembly having first and second identical and symmetrical formed shoe sections, each of said shoe sections having:

a rim portion arcuately formed to provide support for a drum brake lining segment; and

an arcuately extending web portion having a first planar part extending generally perpendicular to said rim portion and joined therewith at adjacent edges of said portions, said web portion further having a second planar part displaced in planar relation from said first planar part and arcuately spaced semi-tubular ends terminating in semi-ball ends;

said first and second shoe sections being positioned together with said web portions first planar parts engaged in planar mating relation and said web portions second planar parts in parallel planar spaced relation and said rim portions extending in opposite directions and said arcuately spaced ends in cooperatively adjacent relation to define at one shoe assembly end a full tube full ball ended adjuster screw engageable means and at the other shoe assembly end an identical full tube full ball ended wheel cyliner piston engageable means;

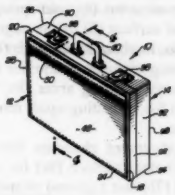
and means securing said first and second identical and symmetrically formed sections together at said mating web portions first planar parts.

4,546,863

PROTECTIVE SHIELD ATTACHE CASE

Henry Kaufman, 1020 E. 14th Pl., Los Angeles, Calif. 90021

Filed Dec. 8, 1982, Ser. No. 448,029
Int. Cl.⁴ F41H *5/08*
U.S. Cl. 190—102 **1 Claim**



1. A hand-carrying case for protecting a user's body from bullets, comprising:

a portable case having a first section and a second section to define a volume therebetween for retaining articles to be transported, said first and second sections being separate and moveable relative to each other to provide access to said volume, said first section having an impact-dampening flexible sidewall and said second section having a sidewall in opposing relation to said flexible sidewall;

edge panels forming a substantially rigid frame for said first section for supporting said flexible sidewall;

an armor plate, said plate being essentially coextensive with said flexible sidewall and being impenetrable by conventional bullets discharged by handguns;

a pouch;

attachment means mounted to the perimeter of the outwardly facing surface of said flexible sidewall and to said pouch for releasably attaching said pouch to the outwardly facing surface of said flexible sidewall, said armor plate being disposed in said pouch and held thereby in a position immediately adjacent to and parallel with said flexible sidewall for coaction with said sidewall; and

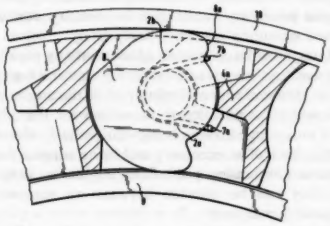
at least one hand strap attached to an outwardly facing side of said sidewall of said second section whereby the user may grasp said hand strap to position the case during use to protect his body from bullets.

4,546,864

ONE-WAY CLUTCH

Max Hagen, Frankfurt, and Johannes Sebulke, Friedrichsdorf, both of Fed. Rep. of Germany, assignors to Ringspann Albrecht Maurer K.G., Bad Homburg, Fed. Rep. of Germany

Filed Aug. 2, 1983, Ser. No. 519,692
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1982, 3229685
Int. Cl.⁴ F16D *41/07*
U.S. Cl. 192—41 A **14 Claims**



1. A clutch element holding cage ring (1) for a one-way clutch, having radially insertable;

friction engagement elements (8) secured to the cage ring between two radially extending surfaces (5) and the axi-

ally extending surfaces (3*a*, 4*c*), and pivotably mounted thereon for engagement with clutching rings (9,10) in one relative direction of rotation of said rings and sliding contact on the clutching rings in a reverse direction of rotation;

and spring elements (7) engageable with the friction engagement elements (8), said spring elements being located at a radial surface (5) of the cage ring,

wherein, in accordance with the invention,

the spring element comprises a spring (7) having a pair of projecting spring arms (7*a*, 7*b*) which are resiliently biassed for spreading-apart movement in essentially parallel planes;

the engagement elements have a first or spring working attachment surface (8*e*) for engagement with one of the arms (7*b*) and a second or spring deflecting surface (8*f*) for engagement with the other one (7*a*) of the arms;

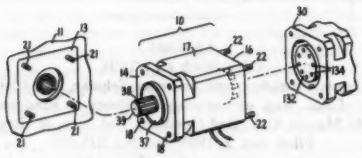
and the engagement elements (8) as well as the cage ring (1) are formed with a first matching cooperating surface pair (3*a*, 8*d*) and an essentially oppositely positioned second matching cooperating surface pair (4*c*, 8*c*) located at different positions with respect to the pivot axis of a respective engagement element than said first matching surface pair, engagement of the second or spring deflecting surface (8*f*) of the engagement element by the other spring arm (7*a*) rotating the element about a pivot axis to a position in which said cooperating surface pairs are opposite each other to prevent inadvertent shift of the engagement elements with respect to the pivot axis in radial direction and thereby retain said engagement elements on the cage ring in loss-preventing position.

4,546,865

AIRCRAFT ENGINE ACCESSORY UNIT DRIVE

John R. Hodgman, 15100 De Vries Rd., and Jack M. Weil, Box 1081, E. Hwy. 12, both of Lodi, Calif. 95240

Filed May 20, 1982, Ser. No. 380,287
Int. Cl.[4] F16D *27/04*
U.S. Cl. 192—84 C **7 Claims**



1. A clutch and mounting assembly for connection between an aircraft engine accessory such as an alternator, a generator, a fuel pump, or the like, and an engine mounting pad to which the engine accessory could also be directly connected, the clutch and mounting assembly comprising:

a body member having a pair of substantially parallel mounting surfaces, one of said mounting surfaces being substantially identical to a mounting pad of the engine and being adapted for connection to the accessory, the other one of said mounting surfaces being substantially identical to an end surface of an accessory and being adapted for connection to a mounting pad of the engine, so that the body member can be inserted between an accessory and a mounting pad; and

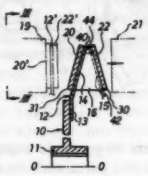
clutch means in said body member including a first member engageable with a mounting pad, a second member engageable with an accessory, the clutch means being operable for selectively providing driving engagement between the first and second members.

4,546,866

CUSHIONING PLATE ASSEMBLY OF A CLUTCH DISC

Takenori Kamio, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Feb. 10, 1984, Ser. No. 578,957
Claims priority, application Japan, Feb. 25, 1983, 58-31477
Int. Cl.[4] F16D *11/00, 13/60*
U.S. Cl. 192—107 C **8 Claims**



1. A clutch mechanism of the type adapted to be compressed between a flywheel and a pressure plate, said clutch mechanism comprising:

an annular clutch disc rotatable about a front-to-rear extending axis of rotation, and

a plurality of cushioning plates spaced circumferentially around an outer periphery of said clutch disc, each said cushioning plate comprising a one-piece member integrally including

a base end connected to said clutch disc,

a front plate portion extending outwardly from said base end in a direction away from said axis of rotation and oriented generally circumferentially relative to said axis of rotation,

a connecting plate portion extending rearwardly from said front plate portion and joined to said front plate portion along a front fold line extending generally toward said axis of rotation,

a rear plate portion extending generally circumferentially from said connecting plate portion in a direction opposite said first plate portion and joined to said connecting plate portion along a rear fold line extending generally toward said axis of rotation, said rear plate portion being inclined relative to said front plate portion as viewed in a direction generally perpendicular to a plane containing said axis of rotation and intersecting said connecting plate portion, and

front and rear facings carried by said front and rear plate portions, respectively, and adapted to be compressed between a pressure plate and a flywheel during a clutching operation,

said front and rear fold lines defining elastic flexure lines about which said front and rear plate portions flex elastically relative to said connecting plate portion during the clutching operation.

4,546,867

COIN INSERT FOR VENDING MACHINE

David E. Terry, Range Rd., Rte. 8, Box 376, Palestine, Tex. 75801, and Donald K. Christian, 119 Woodbine Ter., Spartanburg, S.C. 29301

Filed Jan. 19, 1983, Ser. No. 432,642
Int. Cl.[4] G07F *1/02*
U.S. Cl. 194—1 D **7 Claims**

1. A coin insert for a vending machine through which coins are introduced into a coin mechanism, said coin insert being comprised of;

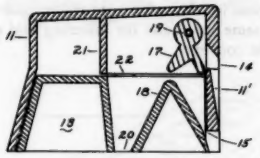
(a) an enclosure generally associated with a coin receiving aperture,

(b) a multiplicity of baffle surfaces one of which is so oriented as to direct coins through an orifice into a coin receiving device and

(c) yet another of which is so oriented as to direct at least a

portion of such precipitation as may enter said coin receiving aperture in a direction other than through said orifice, said baffle surfaces being joined at an apex and so positioned that the space between said apex and said coin receiving aperture is less than the diameter of the smallest coin to be inserted.

7. A push button assembly for a vending machine which has been provided with



(a) a push button having a shank at least in part surrounded by an outer shielding which is associated with

(b) a base having a shank receiving member, comprised of a sleeve extending into said outer shielding, so oriented as to be shielded by said outer shielding in such manner as to inhibit precipitation from entering said vending machine through an opening provided for said push button.

4,546,868

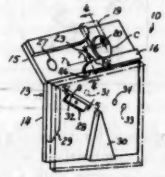
COIN TESTING APPARATUS

Lester Gregory, Jr., Rockford, Ill., assignor to Patent Research Development Corporation, Rockford, Ill.

Filed Mar. 25, 1983, Ser. No. 478,842

Int. Cl.[4] G07F 3/02

U.S. Cl. 194—97 A **3 Claims**



1. A coin testing apparatus for discriminating between acceptable and unacceptable coins and the like, and for providing a vend signal in response to sensing of an acceptable coin, comprising:

an inclined track down which coins fed to the apparatus are constrained to roll from an inlet and thereof to an outlet end;

a plurality of light emitting means and light sensitive means arranged in predetermined spaced relationship to the track to sense a plurality of parameters of the coin as the coin rolls along the track;

first timer means connected with the light sensitive means to be turned on for a predetermined time duration in response to the sensing of a first parameter of the coin, said time duration being calculated to approximate the time it would take a valid coin to roll unimpeded down the inclined track and past all of the light emitting means and the light sensitive means;

magnet means positioned adjacent the track in a location to attract and detain until expiration of the time duration any coin having magnetic material therein;

reject means adjacent the outlet end of the track and operative in response to sensing of an improper parameter to reject coins having the improper parameter;

said light emitting means and associated light sensitive means including a light and phototransistor located adjacent the outlet end of the track in a location such that the light to the light sensitive means is blocked upon passage of a coin therebetween, producing a signal;

second timer means connected to receive said signal, said second timer means being unaffected by passage of an acceptable coin between said light and phototransistor, but being turned on for a predetermined time upon passage of an unacceptable coin or upon withdrawal of a coin therepast; and

said second timer means being connected to reset the first timer means and inhibit a vend for said predetermined time when it is turned on.

4,546,869

COIN TESTING APPARATUS

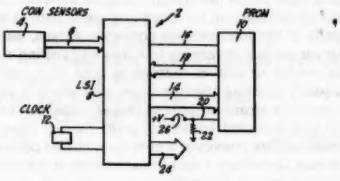
Robert Dean, Farnham Common; Peter J. Reyner, Northwood, both of United Kingdom, and Frederic P. Heiman, Philadelphia, Pa., assignors to Mars Incorporated, McLean, Va.

Filed Feb. 8, 1983, Ser. No. 464,930

Claims priority, application United Kingdom, Feb. 12, 1982, 8204256

Int. Cl.[4] G07F 3/02

U.S. Cl. 194—99 **25 Claims**



9. A coin testing apparatus operable to recognize acceptable coins of one or more acceptable denominations, and to check whether an aspect of the operation of the apparatus is being carried out correctly, said coin testing apparatus comprising means for measuring values indicative of coin properties,

means for storing an acceptability range for an acceptable coin, and to store a test range which differs from the acceptability range for an acceptable coin, and

means for determining whether a measured value indicative of a coin property is within the acceptability range for an acceptable coin, and for determining whether a measured property of a test coin which the apparatus is designed not to accept in the course of its normal operation is within the test range.

21. A method of checking an aspect of the operation of a coin testing apparatus, the method comprising the steps of

storing an acceptability range for an acceptable coin and a first predetermined test range which differs from the acceptability range for an acceptable coin,

inserting into the apparatus a test coin which the apparatus is designed not to accept in the course of its normal operation,

measuring a value indicative of a property of the test coin,

determining whether the measured value lies within the first predetermined test range, and

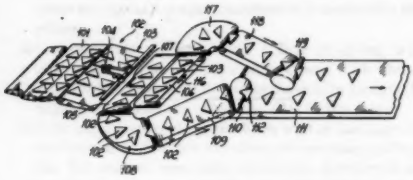
producing a signal indicating that the coin testing apparatus is operating correctly when the measured value is determined to lie within the first predetermined test range.

4,546,870

DEVICE FOR TRANSPORTING AND POSITIONING DOUGH TRIANGLES IN CRESCENT SHAPED DOUGH ROLLS FORMING MACHINES

Bruno Cogo, Via G. Pascoli, 14, Selvazzano Dentro (Province of Padova), Italy

Filed Feb. 3, 1983, Ser. No. 463,363
Claims priority, application Italy, Feb. 12, 1982, 41519 A/82
Int. Cl.[4] B65G *47/24*
U.S. Cl. 198—400 **2 Claims**



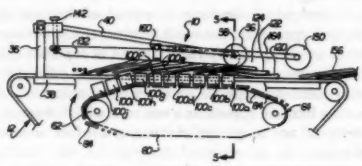
1. In a crescent shaped dough rolls forming machine, wherein dough triangles are arrayed on cutting station leaving conveyor means in at least two rows of triangles with vertices pointing in opposite directions and are transported from said cutting station leaving conveyor means to a rolling station supplying conveyor, a device arranged between said cutting station leaving conveyor means and said rolling station supplying conveyor, comprising at least two intermediate conveyor means operated with opposite conveying directions for receiving each one of said oppositely pointing triangles rows, each of said intermediate conveyor means having oppositely arrange exit ends where the dough triangles leave the conveyor means, means defining an arcuated conveyor path at each of said exit ends of the intermediate conveyor means, said arcuated conveyor paths converging towards said rolling station supplying conveyor to deliver thereon at least two juxtaposed rows of equally pointing triangle rows, and wherein said intermediate conveyor means are part of said arcuated conveyor paths, each of said arcuated conveyor paths having downstream of said intermediate conveyor means an arcuated conveyor and downstream therefrom a rectilinear conveyor directed towards said rolling station supplying conveyor, said arcuated conveyor paths being symmetrically arranged with respect to the axis of said rolling station supplying conveyor, and wherein the device further comprises a transfer cone at the downstream end of said rectilinear conveyor to peform transfer of said dough triangles from said arcuated conveyor to said rectilinear conveyor, means adjustably supporting said transfer cone.

4,546,871

GAP MAKER

Billy M. Duke, Rouses Point, N.Y., assignor to Harris Corporation, Melbourne, Fla.

Filed Sep. 20, 1982, Ser. No. 419,775
Int. Cl.[4] B65G *47/29*
U.S. Cl. 198—425 **13 Claims**



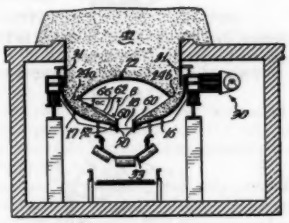
1. An apparatus for forming a gap in a signature stream comprising a conveyor for carrying the signature stream, signature engaging means located adjacent said conveyor, and a circulating mechanism for lifting from said conveyor at least one signature which is located a predetermined distance measured in the direction of conveyor movement from said signature engaging means and for moving said one signature at the same speed and in the same direction as said conveyor after said one signature is lifted, for stopping said one signature by stopping said mechanism with a leading portion thereof directly below said signature engaging means so as to pinch said one signature against said signature engaging means while signatures in advance of said one signature continue moving with said conveyor to thereby form a gap in the signature stream, and for thereafter accelerating said one signature back to said same speed and for lowering said one signature back onto said conveyor.

4,546,872

DISCHARGE CONTROL STRUCTURE FOR VIBRATORY APPARATUS

Albert Musschoot, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Continuation-in-part of Ser. No. 379,655, May 19, 1982, abandoned. This application Feb. 13, 1984, Ser. No. 579,305
Int. Cl.[4] B65G *47/19*
U.S. Cl. 198—525 **5 Claims**



1. In a vibratory apparatus for delivering particulate material and adapted for use in combination with a base having an aperture therein communicating with a passage beneath the base, said vibratory apparatus comprising a trough having an opening in the bottom thereof with the opening extending from one end of the trough to the other end thereof, said trough having spaced end walls, side walls sloping downwardly and inwardly from the side of the trough to said opening, each said side wall having an elongate edge defining a part of said opening, a deflector secured to the trough and extending upwardly therefrom, said deflector having its lower edges spaced from the side walls of the trough and havings its center portion located above the opening in the trough, means for mounting said vibratory apparatus in said aperture in the base to support material piled thereover, said mounting means including springs supporting the trough for vibratory movement, a vibration generator secured to said apparatus for vibrating the same in a direction transverse to the direction of extent of the opening, and a conveyor below the opening in the trough to receive material discharged therethrough, and means for controlling flow of material into the elongate opening comprising:

a gate extending lengthwise adjacent each said edge of each side wall; and

means for mounting said gate for multi-dimensional adjustment relative to the adjacent edge,

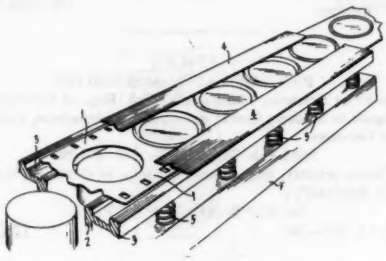
whereby the angle to the horizontal of a line drawn from the uppermost part of each gate and the nearest adjacent lower edge of the deflector is adjustable to be compatible with the static angle of repose for different particulate materials.

4,546,873

ARTICLE RETENTION SYSTEM FOR TRANSFER EQUIPMENT

Michael Debenham, Frankston; Alan G. Dalli, Warrandyte, and Peter L. Revill, Middle Park, all of Australia, assignors to The Broken Hill Proprietary Company Limited, Melbourne, Australia

Continuation of Ser. No. 376,773, May 10, 1982, abandoned. This application Oct. 4, 1984, Ser. No. 658,061
Claims priority, application Australia, May 15, 1981, PE8897
Int. Cl.[4] B65G *15/58*
U.S. Cl. 198—836 **3 Claims**



1. A system for transporting can ends in a predetermined orientation through a plurality of can end reforming stations, said system comprising:

carrying means, including a movable member for supporting said can ends, for moving can ends supported on said movable member from one position to another, said movable member having spacing means for positioning said can ends in predetermined spaced apart relationship and substantially preventing longitudinal and lateral movement of said can ends relative to said movable member; and

orientation maintaining means for preventing a change in orientation of said can ends on said movable member as said can ends move through said plurality of can end reforming stations, said orientation maintaining means comprising a pair of resilient strips biased into engagement with opposite edge portions of said can ends on said movable member, said strips being spaced sufficiently to facilitate the passage of reforming dies into engagement with said can ends, said strips being fixed relative to the motion of said carrying means and to the motion of said can ends, said strips applying a force to said can ends to hold said can ends on said movable member between said strips and said movable member during movement from said one position to another and prevent reorientation of said can ends during said movement.

4,546,874

CONTAINER AND SEALING ENCLOSURE

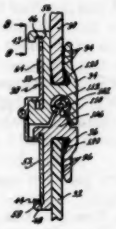
James J. Kirchhan, 23912 Flores Ave., Laguna Niguel, Calif. 92677

Filed Feb. 27, 1984, Ser. No. 584,142
Int. Cl.[4] B65D *6/28, 6/32, 6/34*
U.S. Cl. 220—4 B **19 Claims**

1. A system for maintaining one plastic wall in sealed relationship to another plastic wall of the type found in a container having at least two portions including a top and bottom that come together in closed relationship to form a closure comprising:

a first and second channel member for seating on the plastic walls of each respective first and second portion forming the top and bottom of said container that is to be sealed, wherein each of said channel members has a channel for receipt of the plastic wall in one portion thereof and another portion adapted to seat against the other channel member to provide a sealing relationship; and,

said channel for receiving said plastic wall has at least one barb formed on each of said channel walls in displaced relationship along the depth of the channel from each



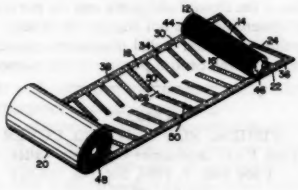
other for bending said wall so that said wall is displaced through the axis thereof so as to be placed with a bending moment within said channel to cause said wall to move against one of said barbs in said channels to cause a cold flow of the plastic of said wall against one of said barbs.

4,546,875

COIN WRAPPER

Cyril J. Zweber, White Bear Lake, Minn., assignor to Pauline C. Zweber, White Bear Lake, Minn.

Filed Jul. 6, 1983, Ser. No. 511,545
Int. Cl.[4] B65D *65/00, 85/62*
U.S. Cl. 206—0.82 **11 Claims**



1. A wrapped roll of coins, comprising:

(a) a roll of coins having a length and a circumference; and

(b) a wrapper comprising:

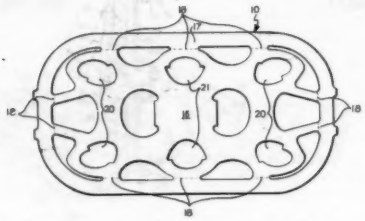
(i) a flexible substrate having: a substrate length and a substrate width, the substrate width being greater than the circumference of the roll, and the substrate length being at least as great as the length of the roll; along the length of the substrate an inside edge which contacts the length of the roll and, at the opposite end of the substrate, an outside edge; along the width of the substrate a pair of side edges; an inner surface which faces radially toward the roll; and an outer surface which faces radially away from the roll; and

(ii) on the inner surface of the flexible substrate proximate the side edges, a coin-supporting amount of an effective clean-releasing pressure-sensitive adhesive, wherein the adhesive securely retains the coins within the wrapper and the coins can be selectively cleanly released from the wrapper without tearing the wrapper, whereby the wrapper can be reused.

4,546,876
BOTTLE CARRIER

Roger R. Rhoads, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 530,823, Sep. 9, 1983, abandoned. This application Feb. 4, 1985, Ser. No. 697,708
Int. Cl.[4] B65D *71/02, 85/62*
U.S. Cl. 206—150 10 Claims



7. A bottle package comprising

a plurality of bottles having a body portion and a neck portion and a closure which form an undercut at the juncture of the periphery of the closure and the neck of the bottle which comprises

a generally flat blank formed of a material that is flexible and elastic,

said blank having a central portion with a plurality of openings receiving the neck of the containers and engaging the containers at the juncture of the closure fillet and the container,

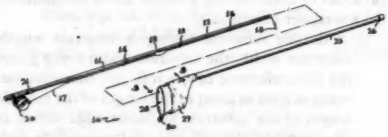
each said opening having a generally elliptical portion extending for about 200°, tabs extending radially inwardly from the extremities of the elliptical portion, and a portion of greater radial dimension connecting said tabs completing the opening, said elliptical portion stretching and deforming about the neck of said bottle and said tabs flexing upwardly out of the plane of said blank under the undercut between the closure and the finish at the intersection of the closure and finish and the portion of greater radial dimension does not engage the bottle,

said portion of greater radial dimension extending toward the center of the central portion of the carrier.

4,546,877
FISHING ROD AND REEL COVER

Jack L. Evans, 10842 Devonshire Cir., Penn Valley, Calif. 95946

Filed Mar. 5, 1984, Ser. No. 586,031
Int. Cl.[4] A45F *5/00*
U.S. Cl. 206—315.11 1 Claim



1. A cover and carrier for an assembled fishing rod and reel combination, comprising:

an elongated rigid hollow tube for insertably receiving the rod portion of said fishing rod and reel combination;

a fabric pouch secured to one end of said tube for enclosing the reel portion of said fishing rod and reel combination;

cushion material carried externally on said pouch for encircling said reel portion;

a cap secured to the end of said tube opposite to its end secured to said pouch;

said tube is composed of rigid material and said pouch is composed of a pliable fabric;

said pouch includes a reduced circular portion insertably receiving the end of said tube;

securement means disposed about said circular portion clamping said pouch to said tube;

said pouch includes an opening for insertably receiving said fishing rod and reel combination;

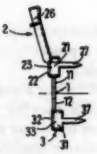
a drawstring closure operably carried on said pouch for selectively closing said pouch opening; and

said cushion material being a band of thick material disposed in a continuous pad around said pouch disposed between said pouch and tube securement means and said pouch opening.

4,546,878
BAND OF LATCH ASSEMBLIES

Karl-Ernst Schmale, Lüdenscheid, Fed. Rep. of Germany, assignor to Schmale GmbH & Co., KG, Lüdenscheid, Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,283
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1982 [illegible]544[U]
Int. Cl.[4] B65D *69/00;* B27F *7/00*
U.S. Cl. 206—343 12 Claims



1. A band of assemblies for use with a fitting machine which attaches each assembly to a respective article, said band comprising:

a common elongated coupling strip;

a plurality of connecting elements affixed to said coupling strip, said connecting elements being serially connected to said coupling strip and spaced from one another along said coupling strip;

a plurality of assemblies each having a cap-shaped attachment member including fastening means for attaching said attachment member to an article, each said cap-shaped attachment member having a wall facing said coupling strip, each said wall having a portion cut and bent therefrom to form a tongue, and each said tongue merging with a respective one of said connecting elements so that each said cup-shaped attachment member is connected to said coupling strip via a respective one of said connecting elements.

11. A band of assemblies for use with a fitting machine which attaches each assembly to a respective article, said band comprising:

a common elongated coupling strip;

a plurality of connecting elements affixed to said coupling strip, said connecting element being serially connected to said coupling strip and spaced from one another along said coupling strip;

a plurality of assemblies each having a cap-shaped attachment member including fastening means for attaching said attachment member to an article, each said cap-shaped attachment member having a first wall facing said coupling strip and a second wall connected to one end of said first wall and being generally perpendicular to said first wall, said second wall of each said cap-shaped attachment member having an angularly bent tongue-shaped projection extending beyond said first wall and merging with a respective one of said connecting elements so that each

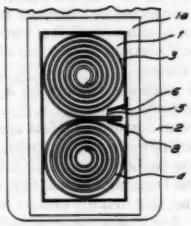
said cap-shaped attachment member is connected to said coupling strip via a respective one of said connecting elements.

4,546,879

TAPE DISPENSER

Fernando Viscasillas, Barcelona, Spain, assignor to Velcro Espanola, S.A., Barcelona, Spain

Continuation of Ser. No. 345,069, Feb. 2, 1982, abandoned. This application Jan. 2, 1985, Ser. No. 688,270
Claims priority, application Spain, Feb. 26, 1981, 256482[U]
Int. Cl.⁴ B65D *85/04*
U.S. Cl. 206—391 **5 Claims**



1. A dispenser, for use in holding and dispensing two tapes of substantially equal thickness each having a prepared surface operative to engage a correspondingly prepared surface of the other tape for adhesion thereto, comprising in combination, an elongated hollow container including two main walls spaced apart from each other and an encircling wall therebetween and connected thereto, said container being adapted to support on its interior said tapes in spaced relation each spirally wound with their prepared prepared surfaces externalized so that said prepared surfaces face one another but remain uncoupled, said encircling wall defining about midway of the length of the container an opening, portions of at least some of said walls establishing a tapered passage extending inwardly from said opening and terminating in a slot, said passage being adapted to receive the protruding end pieces of said tapes to facilitate the grasping of said end pieces by an operator from the exterior so that said tapes are releaseably coupled as they are pulled through said opening to insure that equal lengths of said two tapes are removed from said container.

4,546,880

SHIPPABLE PACKAGE OF GLASS FIBER STRANDS AND PROCESS FOR MAKING THE PACKAGE AND CONTINUOUS STRAND MAT

Walter J. Reese, North Huntington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 2, 1983, Ser. No. 500,496
Int. Cl.⁴ B65H *55/02*
U.S. Cl. 206—410 **25 Claims**

1. A shippable, covered cylindrical package of one or more sized glass fiber strands to provide wet, continuous glass fiber strand with improved payout from the cylindrical package, comprising:

(a) a plurality of layers having substantially equal length, each layer having one or more continuous strands of glass fibers drawn from a source of molten fiberizable glass, said glass fibers during their formation are treated with an aqueous treating composition to provide a coating on a substantial portion of their surfaces, said coating comprising water and a film forming material, wherein water is present in an amount of about 70 to around 99 weight percent of the treating composition and the film forming material is present in an amount to give a coating having about 0.1 to about 3 weight percent LOI and where the strands in the package have a moisture content in the range of at least around 3 weight percent to about 12 weight percent of the strand, and

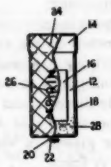
(b) a substantially impervious covering completely sealed around the plurality of layers of strand or strands of coated glass fibers said strand or strands being aged for a time and at a temperature equivalent of at least about two weeks at ambient temperature, said moisture content of the strands being maintained above about 2 weight percent so that the moisture and film forming material cooperate to result in improved payout of the strands from the layers of the package.

4,546,881

TAMPERPROOF PACKAGING

Gerald W. Tasma, 3617 Colonial, NE., Grand Rapids, Mich. 49505

Filed Aug. 3, 1983, Ser. No. 520,024
Int. Cl.⁴ B65D *85/56, 81/20, 33/34*
U.S. Cl. 206—459 **23 Claims**



1. An article with a tamperproof package encapsulating the same, the tamperproof package comprising:

a thin layer of an elastomeric material stretched thinly over the outside surface of the article, the layer of elastomeric material having at least one portion with an opening the edges of which have been gathered together and closed tightly;

the elastomeric layer being stretched to the elastic limit of the material such that the elastomeric layer will rupture and split if penetrated by a sharp object; and

a lubricant between the article and the layer of elastomeric material to facilitate sliding of the elastomeric layer over the article in the event of rupture of the elastomeric layer.

4,546,882

PACKAGE HAVING OIL-CONTAINING PRODUCT

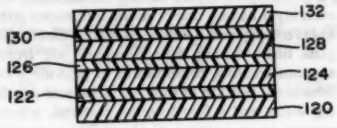
Joseph C. Hsu, Neenah; George O. Schroeder, and Robert A. Steen, both of Appleton, all of Wis., assignors to American Can Company, Greenwich, Conn.

Filed Feb. 7, 1983, Ser. No. 464,692
Int. Cl.⁴ B65D *73/00*
U.S. Cl. 206—484 **10 Claims**

1. A package comprising a multiple layer flexible packaging sheet material and an included product therein containing an oil, said flexible sheet material comprising:

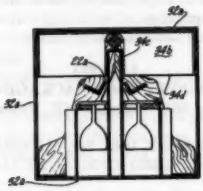
(a) a first layer susceptible to absorption of said oil and swelling upon said absorption of said oil the composition of said first layer being selected from the group consisting

of high density polyethylene and blends of high density polyethylene; and



(b) a second layer, between said first layer and said product, said second layer being functional as a barrier to transmission of said oil, said second layer being chosen from the group consisting of ethylene vinyl alcohol and nylon.

4,546,883
PORTABLE WINE RACK
Ralph A. Youngdale, 4701 Sierra, Howell, Mich. 48843
Filed Dec. 18, 1984, Ser. No. 682,927
Int. Cl.[4] B65D *81/02*
U.S. Cl. 206—521 **13 Claims**



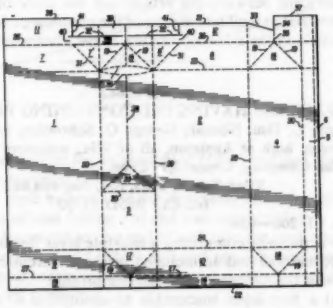
1. A wine rack comprising:

A. a plurality of frame members defining an A frame;

B. bottle storage means on the exterior sloping surfaces of said A frame defining a plurality of horizontal support surfaces each configured to support a horizontally disposed wine bottle thereon; and

C. glass storage means on said A frame for supporting a plurality of wine glasses in vertical position within the umbrella of said A frame.

4,546,884
TEAR STRIP END CLOSURE ON LIQUID TIGHT CARTON
Morris W. Kuchenbecker, Neenah, Wis., assignor to James River - Norwalk, Inc., Norwalk, Conn.
Filed Nov. 2, 1983, Ser. No. 548,089
Int. Cl.[4] B65D *5/70*
U.S. Cl. 206—611 **11 Claims**



1. A liquid tight carton constructed from a structural carton material, said material including a heat sealing material at least on the inner surface thereof, said carton comprising:

a bottom;

upstanding opposite sidewalls; and

end panels joining said sidewalls along fold lines, said end panels comprising a sealing end panel portion defining a sealing end of the carton and a spout end panel portion defining a spout end of the carton, said spout end panel portion comprising lower spout forming panels, intermediate spout edge portions, and upper end panel tear-off portions, said intermediate spout edge portions being connected to said lower spout forming panels along fold lines, said upper end panel tear-off portions being comprised of opposite panels disposed to be adhered one to the other to seal the carton, said end panel tear-off portions also being connected to said spout edge portions at a line of structural weakness such that tearing off said upper end panel tear-off portions at said line of structural weakness opens said carton;

said opposite sidewalls comprising a first sidewall and a second side wall;

said first sidewall comprising a first upper carton portion on the extremity of the carton opposite said bottom, said first upper carton portion comprising a first top closure connected to the remainder of said first side wall along a side wall fold line, said first top closure including a first lower panel, said first lower panel including a first side wall spout forming panel, and a remaining first lower panel portion, said first sidewall spout forming panel connected at a spout side wall fold line to an adjacent lower spout forming panel in said spout end panel portion;

said first top closure also including a first upper sealing panel, said first upper sealing panel being comprised of a first sidewall spout edge forming portion connected along a fold line to said first side wall spout forming panel, a first side wall tear-off portion adjacent and above said first sidewall spout edge forming portion and connected thereto by a line of structural weakness, said first side wall tear-off portion having a first upper side wall tear-off portion free edge, said first upper sealing panel including a first rear sealing portion between said first side wall tear-off portion and said sealing end panel portion, said first rear sealing portion having a first upper rear sealing portion free edge, said first rear sealing portion also being connected to said first side wall tear-off portion by a line of structural weakness, said first upper rear sealing portion free edge being spaced above said first upper side wall tear-off portion free edge to facilitate initial tearing along the line of structural weakness between said first rear sealing portion and said first side wall tear-off portion;

said second side wall comprising a second upper carton portion on the extremity of the carton opposite said bottom, said second upper carton portion comprising a second top closure connected to the remainder of said second side wall along a side wall fold line, said second top closure including a second lower panel, said second lower panel including a second side wall spout forming panel and a remaining second lower panel portion, said second side wall spout forming panel connected at a spout side wall fold line to an adjacent lower spout forming panel in said spout end panel portion;

said second top closure also including a second upper sealing panel, said second upper sealing panel being comprised of a second side wall spout edge forming portion connected along a fold line to said second side wall spout forming panel, a second side wall tear-off portion adjacent and above said second side wall spout edge forming portion and connected thereto by a line of structural weakness, said second upper sealing panel including a second rear sealing portion between said second sidewall tear-off portion and said sealing end panel portion, said second rear sealing portion also being connected to said second side wall tear-off portion by a line of structural weakness;

said first top closure and said second top closure being dis-

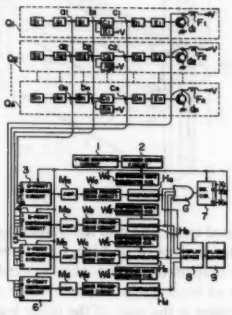
posed to close the top of said carton, said first upper sealing panel disposed to be adhered to said second upper sealing panel, one of said first and second rear sealing portions disposed in a surface to surface relationship with one of said remaining first and second lower panel portions and bonded thereto.

4,546,885

DIAGNOSTIC DEVICE FOR COLOR SORTING APPARATUS

Toshihiko Satake, Higashihiroshima, Japan, assignor to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Sep. 20, 1983, Ser. No. 534,100
Claims priority, application Japan, Dec. 25, 1982, 57-226500
Int. Cl.[4] B07C *5/342*
U.S. Cl. 209—548 **6 Claims**



1. A diagnostic device for a colour sorting apparatus having a plurality of sorting channels, the device comprising:

a scanner circuit means having a plurality of switching circuits respectively connected to a plurality of measuring points disposed at each of said sorting channels, the switching circuits being operable to select one after another successively a particular sorting channel to be measured among said sorting channels;

a comparator circuit means for comparing output signals measured at said respective measuring points within said selected sorting channel with reference signals preset for said respective measuring points; and

an alarm means for indicating the malfunctioning portion of said selected sorting channel which is out of order upon receipt of the signals from said scanner circuit means and said comparator circuit means,

whereby the malfunctioning sorting channel and the malfunctioning portion therein are indicated by said alarm means if there is a discrepancy between said reference signals and said output signals when compared by said comparator circuit means.

4,546,886

METHOD AND APPARATUS FOR SORTING ELONGATE ARTICLES

Mark T. Churchland, Burnaby, and Walter W. Schilling, Delta, both of Canada, assignors to MacMillan Bloedel Limited, Vancouver, Canada

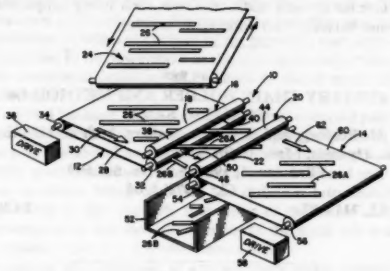
Filed Aug. 10, 1982, Ser. No. 406,768
Int. Cl.[4] B07B *13/04*
U.S. Cl. 209—665 **5 Claims**

1. A method of sorting thin wood strands of varying lengths into desired strands having a length equal to or above a preselected length and undesired strands having a length less than the preselected length comprising the steps of:

depositing a plurality of wood strands having varying lengths onto a top run of moving conveyor means with the lengthwise dimension of the strands at an angle of from about 30° to about 60° of the direction of motion of the conveyor belt;

driving the conveyor means to move the top run toward a discharge end of the conveyor means and convey the strands to the discharge end of the conveyor means;

continuously holding with holding means the strands as they pass the discharge end of the conveyor means in a plane in which the top run of the conveyor means travels in the area adjacent the discharge end until the strands are released by the holding means;



grasping the forward ends of desired strands having a length equal to or greater than the preselected length with grasping means located a distance away from the end of the first conveyor means before the rearward ends of the desired strands are released by the holding means;

forming a gap between said holding means and said grasping means;

dropping undesired strands having a length less than the preselected length into the gap between the holding means and the grasping means; and

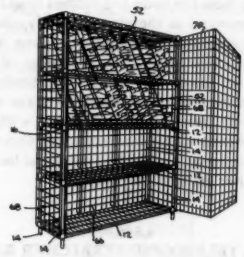
conveying the desired strands away from said holding means.

4,546,887

SYSTEM FOR SUPPORTING CYLINDRICAL ARTICLES, SUCH AS WINE BOTTLES, IN BULK

Robert J. Cohn, Dallas, Pa., assignor to InterMetro Industries Corporation, Wilkes-Barre, Pa.

Filed Aug. 12, 1983, Ser. No. 522,717
Int. Cl.[4] A47F *7/00*
U.S. Cl. 211—49.1 **17 Claims**



1. A system for supporting generally cylindrical articles, comprising:

platform means;

means for supporting said platform means in generally horizontal relation;

first spacer wall means projecting upwardly from and forming an obtuse angle with said platform means; and

retaining means projecting upwardly from said platform

means and spaced from said spacer wall means said spacer wall means and the portion of said platform means between said spacer wall means and said retaining means defining said obtuse angle, the distance between said spacer wall means and said retaining means being at least equal to twice the effective diameter of one of the articles; whereby a first row of at least two articles may be supported on said platform means between said spacer wall means and said retaining means, and additional rows of a number of articles equal to the number of articles in the first row may be supported on an underlying row; a portion of the articles in each additional row each being supported by and between two underlying articles.

4,546,888

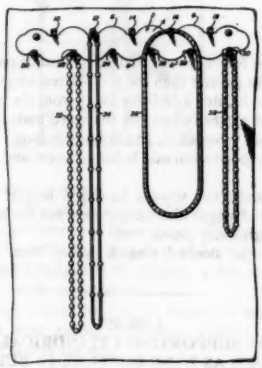
JEWELRY CHAIN HOLDER AND METHOD OF FORMING SAME

Carl H. Rosberg, and Hazel N. Rosberg, both of 111 Airport Rd., Hyannis, Mass. 02601

Filed Jan. 6, 1984, Ser. No. 568,699

Int. Cl.⁴ A47F *5/08*

U.S. Cl. 211—87 **2 Claims**



1. A jewelry chain holder comprising:

a. an elongate body of sheet material, the body having an upper edge and a lower edge and having means for attaching the body to a support surface; and

b. a plurality of hooks integral with the body and projecting outwardly from the body and formed from the same single sheet of material as the elongate body, the hooks being uniformly spaced in an upper row along the upper edge and a lower row along the lower edge of the body, the hooks of the lower row being in vertically intermediate positions with relation to the hooks of the upper row, the hooks being reinforced lengthwise with creases, the creases formed to provide rounded, upper bearing surfaces of the hooks, and each of the hooks having upwardly curved outer extremities.

4,546,889

UNIVERSAL TELESCOPIC STRETCHER RAIL SYSTEM

Raoul J. P. Schoumaker, Wyoming, and Mark A. Harter, Hamilton, both of Mich., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 2, 1983, Ser. No. 519,631

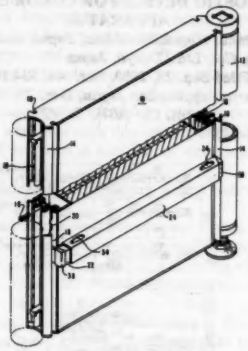
Int. Cl.⁴ A47H *1/08*

U.S. Cl. 211—105.3 **4 Claims**

3. A universal stretcher rail system for use in connection with a space dividing wall panel system including wall panels of different lengths having vertically oriented laterally spaced slotted standards at each end thereof, said stretcher rail system comprising:

an inner rail member;

a plurality of hollow tubular outer rail members of varying lengths each individually adapted to be selectively associated with said inner rail member to produce a stretcher rail of a predetermined length, said inner rail member being telescopically received in said outer rail member;



a first L-shaped mounting clip secured along one leg thereof to the outer surface of said inner rail member;

a second L-shaped mounting clip secured along one leg thereof to an inner surface of said outer rail member; and

connector means at the ends of the other legs of each of said first and second mounting clips extending away from said rail members, said connector means constructed and arranged to coact with said vertical slotted standard to mount said stretcher rail to said wall panel.

4,546,890

AUTOMATIC HOIST AND TRAVERSING APPARATUS

Christian le Bars, 22, rue de Montfort, 78190 - Trappes, France

Filed Jan. 18, 1984, Ser. No. 571,795

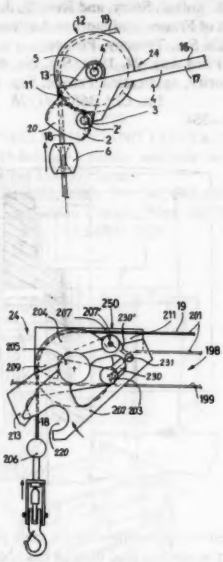
Claims priority, application France, Jan. 18, 1983, 83 00668; Dec. 5, 1983, 83 19384

Int. Cl.⁴ B66C *21/00*

U.S. Cl. 212—98 **11 Claims**

1. Load hoisting and traversing apparatus comprising a roller track, a carriage movable along said roller track, cable return means on said carriage, a hoisting and traversing cable extending around said cable return means, drive means spaced from said carriage for driving said cable to hoist a load and to traverse said carriage for driving said cable to hoist a load and to traverse said carriage along said roller track, first rollers on said carriage pivotally supporting said carriage on a first part of said roller track for pivotal movement between a hoisting position and a traversing position, second rollers mounted on said carriage for preventing pivoting movement of the carriage from the traversing position to the hoisting position while said second rollers engage a second part of said roller track, and for allowing said pivotal movement to said hoisting position at an interruption of said second part of the roller track in at least one hoisting location, cooperating locking means on said carriage and on said roller track for locking the carriage against traversing movement along the roller track when said carriage is in its hoisting position in said hoisting location, support means on said carriage for supporting a load, and stop means

attached to said cable for driving said carriage from said hoisting position to said traversing position upon engaging said



support means during hoisting, and for securing said cable to the carriage when the carriage is in said traversing position.

4,546,891

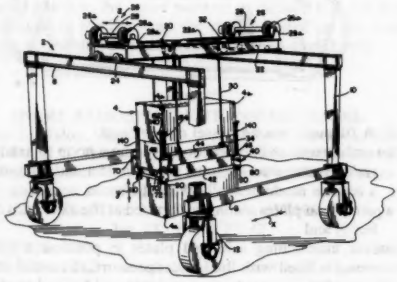
GRAPPLER SYSTEM FOR LIFTING APPARATUS

John J. Lanigan, Sr., Tinley Park; Myron Glickman, Morton Grove; Thazhuthekudiyil V. George, Chicago, and Bernard A. Ermel, Clarendon Hills, all of Ill., assignors to Mi-Jack Products, Inc., Hazel Crest, Ill.

Continuation of Ser. No. 583,119, Feb. 24, 1983, abandoned, which is a continuation of Ser. No. 346,513, Feb. 8, 1982, abandoned. This application Dec. 20, 1984, Ser. No. 683,970

Int. Cl.⁴ B66C *17/06*

U.S. Cl. 212—221 **7 Claims**



1. An apparatus for lifting container of the type having apertures at the corners thereof comprising:

grappler means for engaging one or a plurality of stacked containers, a movable bridge with suspended lift means thereon, means operatively connecting said lift means to said grappler means to position said latter means adjacent a container or stack thereof for lifting same;

said grappler means having frame means disposed adjacent the lowermost container of the stack to be lifted to said position;

said grappler means further including first and second latching means, said first and second latching means being mounted on said frame means for latching to the lowermost container and any second container immediately thereabove in said stack, said first and second latching means being operative to engage apertures at the corners of the lowermost and the second container for lifting one or more containers;

said first latching means including at least a first pair of pin members horizontally arranged generally along a first common horizontal axis for respective insertion into said apertures of selected corners of the opposite end walls of either one of the lowermost or the second container above the lowermost container of the stack of one or more containers;

said second latching means including at least a second pair of pin members horizontally arranged generally along a second horizontal axis normal to said first axis and vertically spaced relative to said first axis, said second pair of pin members being mounted for insertion into selected apertures in the opposite side walls of the other of the lowermost or the second container of the stack when the containers are in a stacked relationship;

said axis of said first pair of pin members being vertically spaced from the axis of said second pair of pin members to permit said first and second pairs of pin members to simultaneously engage the upper apertures in the lowermost container and the lowermost apertures in the second container immediately above the lowermost container;

said frame means including spaced lateral beams and a pair of longitudinal beams supporting said second latching means, said latter beams being selectively extensible to vary the length thereof to accommodate different size containers; and

said first latching means depends downward from said pair of spaced lateral beams, said first latching means further including means for permitting withdrawal of said first pair of pins of said first latching means from said lowermost container, means mounted on one of said beams for permitting lost-motion movement of one of said latching means.

4,546,892

PLASTIC SEALING SCREW CAP WITH IMPROVED TAMPER-PROOF STRIP

Francis Couput, Bizanos, France, assignor to Cebal, Clichy, France

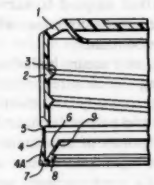
PCT No. PCT/FR83/00072, § 371 Date Dec. 13, 1983, § 102(e) Date Dec. 13, 1983, PCT Pub. No. WO83/03809, PCT Pub. Date Nov. 10, 1983

PCT Filed Apr. 19, 1983, Ser. No. 567,867

Claims priority, application France, Apr. 23, 1982, 82 07467; Mar. 7, 1983, 83 04093

Int. Cl.⁴ B65D *41/34*

U.S. Cl. 215—252 **10 Claims**



1. A plastic sealing cap with an improved tamper-proof strip, said cap being adapted for use on a container having an opening in a neck on the external peripheral surface of which is a

counter-ring having an inwardly extending shoulder facing away from the opening of the container, said cap comprising:

(a) a head which fits over the opening of the container;

(b) a first annular skirt which extends from said head and which fits over the neck of the container; and

(c) an annular tamper-proof strip connected to said first annular skirt by a plurality of bridges which are sized and shaped so as to be broken when the cap is removed from the container, said annular tamper-proof strip comprising:

(i) a first annular part connected to said plurality of bridges and

(ii) a plurality of tabs connected to and projecting inwardly from said first annular part toward the opening of the container, each of said tabs comprising a heel which is sized, shaped, and positioned to abut against the inwardly extending shoulder on the counter-ring and a thinner extension which is sized, shaped, and positioned to be wedged between said first annular part and the external surface of the counter-ring.

4,546,893

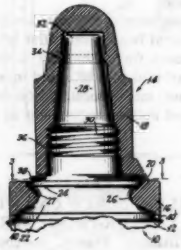
TAMPER-EVIDENT CLOSURE CAP CONSTRUCTION

Gene Stull, 5 Oak St., Chester, N.J. 07930

Filed Oct. 22, 1984, Ser. No. 663,549

Int. Cl.[4] B65D *1/02*

U.S. Cl. 215—252 **20 Claims**



1. A tamper-evident plastic closure cap construction for use with a container of the type having a discharge orifice and having a fastener means thereon, comprising in combination:

(a) a base portion provided with means cooperable with the fastener means of the container to lock said base portion to the container against removal therefrom, said base portion being constituted as a piece separate from the container,

(b) a closure portion adapted to surround and seal off the discharge orifice of the container when the base portion is attached to the container,

(c) frangible connector means including a plurality of frangible webs joining the closure portion to the base portion, said webs rupturing adjacent their points of attachment respectively to said base portion, and remaining essentially intact at other points of attachment respectively to said closure portion when said closure and base portions are forcibly shifted a predetermined amount with respect to each other,

(d) said frangible webs being normally stressed in a downward direction and swinging upwardly upon said rupturing occurring, thereby providing a visual tamper-evident indication in response to rupture of the webs.

4,546,894

HOODED STOPPER

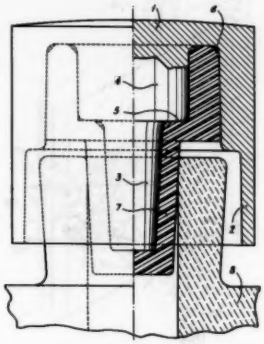
Jean-Pierre A. Suinat, Soisy, and Rene P. J. Suinat, Enghien les Bains, both of France, assignors to Anciens Ateliers Macler P. Suinat & Cie Srs, Taverny, France

Filed Aug. 24, 1984, Ser. No. 643,824

Claims priority, application France, Sep. 8, 1983, 83 14312

Int. Cl.[4] B65D *41/28*

U.S. Cl. 215—354 **4 Claims**



1. A hooded stopper comprising a male piece constituted by a plate, a skirt bordering said plate, a base on said plate defining a groove between said base and said skirt and a teat disposed on an end of said base and a female piece made of a material more malleable than that of the male piece, disposed on said teat in contact with and wedged between the base, the plate and the skirt.

4,546,895

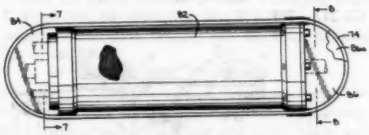
LOOP BOUND ORTHOTROPIC PRESSURE VESSEL

Fred R. Pflederer, Milwaukee, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed May 31, 1984, Ser. No. 616,567

Int. Cl.[4] B65D *53/02*

U.S. Cl. 220—3 **20 Claims**



1. A filament wound vessel comprising:

an orthotropic cylindrical body having a hoop to axial stress ratio greater than or equal to about 15:1 and composed of a tension mode helically wound fibrous strand;

a pair of end plates sealingly disposed at the axial ends of said body; and

means maintaining said end plates in position when said vessel is filled with fluid under pressure, the radial component of the internal pressure within said vessel tending to expand said cylindrical body radially, the axial component of said internal pressure acting against said means maintaining said end plates,

wherein said means maintaining said end plates comprises at least one continuous loop comprising a filament wound orthotropic member having axially extending fibers in axial tension providing substantially greater axial strength than transverse strength,

said cylindrical body being substantially wound only in the

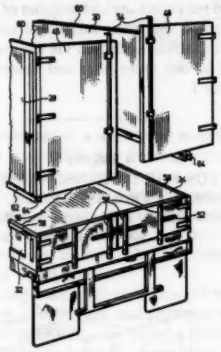
hoop direction without winding around the axial ends of said body such that said filament wound cylindrical body carries substantially only radial loading, and said end plates and filament wound continuous loop carry substantially only axial loading, whereby to substantially separate and isolate radial loads from axial loads.

4,546,896

COLLAPSIBLE SHIPPING CONTAINER

Gilbert M. Reid, Uxbridge, Canada, assignor to The Cypress Group Limited, Port Perry, Canada

Filed Dec. 27, 1983, Ser. No. 565,579
Claims priority, application Canada, Nov. 30, 1983, 442297
Int. Cl.[4] B65D *7/26*
U.S. Cl. 220—4 F **10 Claims**



1. A rectangular container which is convertible between erect and collapsed positions and in the erect position is higher than it is wide comprising a floor, a pair of side walls, first and second end walls, and a roof, each of the side and end walls having an upper portion and a lower portion, the lower portions extending along respective edges of the floor to form a rigid base with the lower portions of the side walls being spaced apart a distance greater than the height of the upper portions of the side walls, the upper portions of the side and end walls each being removably mounted on a respective lower portion in the erect position, the upper portions being disengageable from each other and the roof whereby, in the collapsed position, the upper portions of the side and end walls are received in the base and the roof is seated on the lower portions of the side and end walls to form a closed unit.

4,546,897

INERT ATMOSPHERE TRANSFER VESSEL

Joseph T. Maloy, West Orange, N.J.; John F. Leonard, Xenia, and David H. Fritts, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 2, 1984, Ser. No. 657,100
Int. Cl.[4] B65D *17/42*
U.S. Cl. 220—277 **8 Claims**

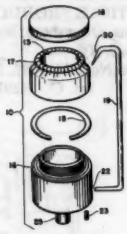
1. A hermetically sealed vessel for the temporary containment of a sample or the like under protective atmosphere, which comprises:

a. a container defining a cavity therein and presenting an opening thereinto for receiving said sample;

b. an annular lip surrounding said opening;

c. a flexible, puncturable membrane sized for stretching over said annular lip and configured for hermetically sealing said opening thereby; and

d. a wire bridge configured at one end for attachment to said container, and having a point at the other end positioned near said puncturable membrane whereby pressure internal of said container sufficiently expands said membrane



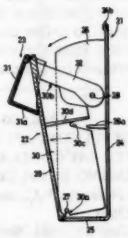
against said point under the influence of reduced pressure external of said container.

4,546,898

BOX

Kenji Ekuan, Tokyo, Japan, assignor to C. I. Kasei Co., Ltd., Tokyo, Japan

Filed Jan. 10, 1984, Ser. No. 569,707
Claims priority, application Japan, Jan. 11, 1983, 58-1288[U]; May 20, 1983, 58-74487[U]
Int. Cl.[4] B65D *51/04*
U.S. Cl. 220—337 **4 Claims**



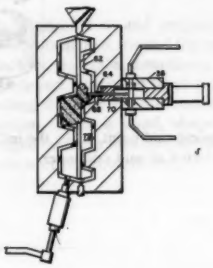
1. A box, comprising: a box body comprising a back plate, a bottom plate and a left and a right side plate; a front plate section comprising a forwardly openable front plate and a left and a right wing plate which extend from respective opposite sides of said front plate and contact said left and right side plates, respectively; means for pivotably supporting said front plate at its lower end; a cover section comprising a top plate provided with a collar extending therefrom and left and right downwardly extending arms; and means for swingably pivoting said cover section on said box body via said arms such that said cover section is movable between a first position wherein said collar abuts said front plate and said back plate is releasibly engaged with said top plate, and a second position in which said cover section lies substantially forwardly of said front plate, with said arms in contact with said wings and said front plate.

4,546,899

APPARATUS AND METHOD FOR PRODUCING MOLDED HOLLOW ARTICLE WITH FILLING OF FOAMED PLASTIC THERMAL INSULATION, AND ARTICLE PRODUCED THEREBY

W. Jerry Williams, Owensboro, Ky., assignor to Omico Plastics, Inc., Owensboro, Ky.

Filed Nov. 22, 1982, Ser. No. 443,789
Int. Cl.[4] B29D 27/04
U.S. Cl. 220—444 16 Claims



1. A method for producing a molded hollow article with a filling of foamed plastic thermal insulating material, comprising:

inserting a hot precursor, made of polyolefin, for a polyolefin article shell into a relatively cool mold having a mold cavity with an internal molding surface therein;

conforming the hot precursor against the internal molding surface to define an article shell having an internal cavity bounded by an internal surface of the article shell;

introducing through the mold and through the article shell into the internal cavity of the article shell, a quantum of activated, foamable, settable plastic thermal insulation material while said article shell remains hot, so that as the article shell is being cooled from about 350° F. by contact with the mold, the thermal insulation material foams, fills the internal cavity of the article shell, adhering to the internal surface of the article shell, and sets to form a foamed core of polyurethane that is extensively adhered to the article shell to define an article; and

removing the article from the mold.

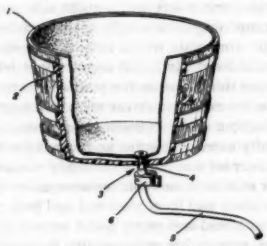
7. An article produced by the process of claim 1.

4,546,900

CONTAINER HAVING AN INTERNAL LINER TOGETHER WITH METHOD AND APPARATUS FOR FORMING SUCH CONTAINER

Robert W. Lackey, Hickory, N.C., assignor to The Mead Corporation, Dayton, Ohio

Filed Jun. 11, 1984, Ser. No. 619,793
Int. Cl.[4] B29D 27/04; B65D 23/02, 90/04
U.S. Cl. 220—453 20 Claims



1. A method of forming a foamed polyurethane resin container having an internal liner, said method comprising the steps of pouring foamable polyurethane into an open mold cavity, placing a preformed plastic liner over a center core plug, inserting said center core plug and liner into said open mold cavity while the foamable polyurethane is in fluid condition, and forcing said center core plug and liner into a predetermined position within said open mold cavity and maintaining said center core plug and liner in said predetermined position for a period of time sufficient to allow said polyurethane to foam, rise, set and cure thereby to form the container about said liner.

9. An open container consisting essentially of an outer part formed of molded foamed polyurethane and an inner liner of preformed plastic material bonded to the inner surface of said outer part and made according to the method of claim 1.

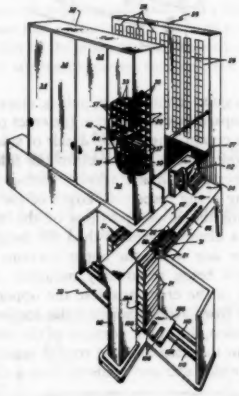
12. An open container comprising an outer part formed of molded foamed polyurethane and an inner of preformed plastic material bonded to the inner surface of said outer part and wherein an outlet drain is formed via aligned passages in said outer part and in said inner liner and made according to the method of claim 1.

4,546,901

APPARATUS FOR DISPENSING MEDICATION

Patrick J. Buttarazzi, 4 Fitch Ave., Auburn, N.Y. 13021

Filed Feb. 2, 1984, Ser. No. 576,449
Int. Cl.[4] B65B 57/20
U.S. Cl. 221—10 22 Claims

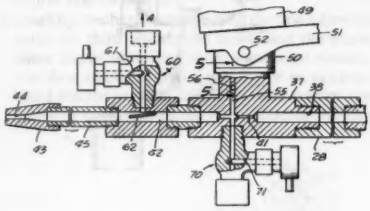


1. Medication dispensing apparatus comprising a vertical rack for storing a substantial number of elongated pill strips one above the other, each pill strip having a row of pills mounted thereon in spaced relation to one another, a vertically movable carriage for the rack having means for grasping an exposed edge of a pill strip and withdrawing a portion of it from the rack to expose a predetermined number of pills, the carriage being selectively movable with respect to the rack to position its grasping means opposite a predetermined pill strip, cutting means on the carriage for cutting the pill strip so that the exposed pill or pills are severed therefrom, conveyor means positioned with respect to the vertical rack so that the severed pills fall on to it, a receptacle for receiving the severed pills, the conveyor means being operable to deposit the pills in the receptacle, an inspection station forming a part of the medication dispensing apparatus, and means for automatically moving the receptacle to the inspection station after the pills have been deposited therein.

4,546,902
APPARATUS FOR CONTROLLING THE RATE OF FLUENT MATERIAL

James Y. Anderson, 1838 Cliffhill Dr., Monterey Park, Calif. 91754

Division of Ser. No. 317,383, Nov. 2, 1981, Pat. No. 4,411,935.
This application Apr. 13, 1983, Ser. No. 484,452
Int. Cl.[4] B67D *5/56, 3/00*
U.S. Cl. 222—129.2 12 Claims



1. An improvement in a device for controlling the flow of fluent material suspended in a flowing stream of pressurized gas which comprises:

means providing a supply of fluent material;

flow confining means for conveying a stream of pressurized gas through aspirator means and into a gas and fluent material mixing chamber before dispensing the same through an outlet port;

conduit means constructed and arranged to be responsive to the flow of gas through said aspirator means to conduct fluent material from said supply thereof into said gas stream closely adjacent the downstream end of said aspirator means; and

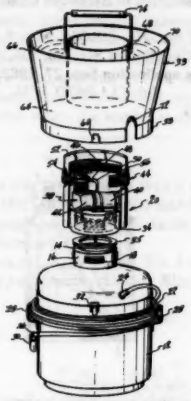
means for regulating the pressure of said gas in said mixing chamber by varying the amount of gas bled from said mixing chamber at a point upstream from said outlet port independently of the gas pressure upstream from said aspirator means thereby to vary the rate of fluent material flow through said conduit means and into said stream of gas.

4,546,903
PORTABLE CAR WASH UNIT

David J. Burch, 107A Kenneth St., East Haven, Conn. 06512

Filed Jun. 23, 1983, Ser. No. 507,050
Int. Cl.[4] B65D *83/00*
U.S. Cl. 222—130 7 Claims

1. A portable car wash unit assembly comprising a first hollow liquid reservoir, said first hollow liquid reservoir being provided with a neck portion defining an opening into the interior of said first hollow liquid reservoir, closure means removably secured to said neck portion for sealing said first hollow liquid reservoir, an air compressor mounted on said closure means and having a compressed air outlet in fluid communication with the interior of said first hollow liquid reservoir in sealing engagement therewith for providing a head of compressed air over liquid in said first hollow liquid reservoir, outlet hose assembly associated with the interior of said first hollow liquid reservoir for delivering liquid under pressure from said first hollow liquid reservoir and a second reservoir removably secured to the exterior surface of said first hollow liquid reservoir, said second reservoir being formed in

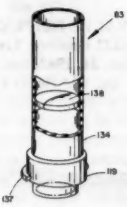


part by a hollow tubular portion adapted to telescopically receive said closure means.

4,546,904
DISPENSER AND PACKAGE FOR LIQUID OR GRANULAR MATERIALS

John R. Frassanito, San Antonio, Tex., assignor to Sani-Fresh International, Inc., San Antonio, Tex.

Division of Ser. No. 176,909, Aug. 11, 1980, Pat. No. 4,394,938.
This application Sep. 20, 1982, Ser. No. 420,330
Int. Cl.[4] B67D *5/06*
U.S. Cl. 222—185 8 Claims



1. A detachable package for granular material for engagement with a separate dispenser, comprising:

a housing, having an upper and a lower end, for containing said granular material;

an opening formed in the lower end of said housing;

a resilient tube, having an upper and a lower end, extending downwardly from the lower end of said housing, the upper end of said tube being in communication with said opening to allow flow of said granular material from the interior of the housing into said tube, said lower end of said tube having a discharge opening therein; and

a slit diaphrahm valve disposed within said tube and disposed intermediate the upper and lower end of said tube, said disposition of said valve effecting closure of said valve after dispensing of said granular material and said valve adapted to be opened by said dispenser after being detachably engaged with said dispenser to allow ready and direct egress of said granular material from said discharge opening in said tube.

4,546,905

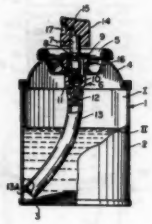
AEROSOL DISPENSING SYSTEM

Arun Nandagiri, Dover, and Richard G. S. Pong, Passaic Park, both of N.J., assignors to American Cyanamid Co., Stamford, Conn.

Continuation of Ser. No. 318,504, Nov. 5, 1981, abandoned, which is a continuation of Ser. No. 136,201, Apr. 1, 1980, abandoned. This application Sep. 27, 1982, Ser. No. 424,693

Int. Cl.⁴ B67D *5/58*

U.S. Cl. 222—189 **5 Claims**



1. An aerosol package comprising a container under pressure a vaporized propellant and a liquified product, said propellant and product being present as at least two separate phases, and a valve means comprising a valve having a single inlet enclosed by a hollow, porous plastic diptube extending to the base of said container, said diptube being closed at the bottom, said dip-tube and closed bottom thereof being impervious to said vaporized propellant, and substantially void of any filler material therein, whereby said diptube permits unobstructed flow therethrough and the container can be positioned for use in any orientation.

4,546,906

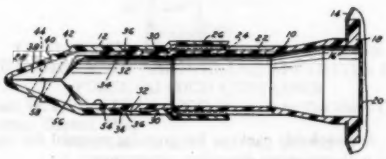
CHUCK VALVE DISPENSING MEANS

Kenneth Vadnais, 20322 Beatrice, Livonia, Mich. 48152

Filed Oct. 24, 1983, Ser. No. 544,718

Int. Cl.⁴ B65D *47/00*

U.S. Cl. 222—502 **19 Claims**



1. A valve to control the flow of viscous material comprising an elongated body, a central opening extending axially substantially through the body, attachment means on one end of the body, a hollow sealed and trimmable cap retained on the other end of the body, said cap as trimmed being movable between closed and open positions relative to the body,

a plurality of nestable and trimmable segments on the body and enclosed within the cap, said nestable segments as trimmed adapted to sealingly close the central opening of the body at the body end within the cap with the cap as trimmed in the closed position on the body and adapted to open an axial passage into communication with the central opening through the end of the body within the cap with the cap in the open position, and said cap as untrimmed retaining the valve sealed with the cap in the open position.

4,546,907

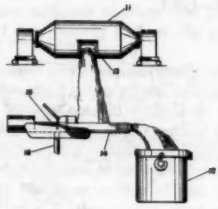
METHOD AND SYSTEM FOR REMOVAL OF RESIDUAL MATERIAL FROM TORPEDO CARS

Mern S. Kemble, 130 Entrance Dr., New Kensington, Pa. 15068

Filed Feb. 23, 1983, Ser. No. 469,030

Int. Cl.⁴ B22D *23/00, 41/04*

U.S. Cl. 222—590 **8 Claims**



1. System for facilitating transfer of molten pig iron and slag from a torpedo car to a ladle, comprising:

a. a torpedo car for containing molten pig iron and slag;

b. a ladle for holding molten pig iron;

c. a container having a generally flat bottom surface made of a heat resistant material upon which said pig iron and slag is poured from said torpedo car and an open top, said container having at least three raised sides to contain poured pig iron and slag and an at least partially open side for the poured pig iron and slag to be removed into said ladle, one of said raised sides being movable along said flat bottom surface so as to be able to push said pig iron and slag and to cause exit thereby through said open side; and

d. means for causing said movable raised side to move along said flat bottom surface and to return to its original position.

8. A method for transferring molten and slag from a torpedo car into a ladle, comprising:

a. pouring molten pig iron and slag from the torpedo car onto a generally flat, heat resistant bottom surface of a container having three raised sides, an open side, an open top, said open side being positioned proximate to a ladle;

b. moving one of said raised sides against said molten pig iron and slag contained on said flat bottom surface so as to cause said pig iron and slag to exit from said container and pass into said ladle.

4,546,908

HORIZONTAL PAPER FORM POSITIONER AND ADJUSTING MECHANISM

Samuel E. Cassese, Northridge, and Walter Marquez, Canoga Park, both of Calif., assignors to Dataproducts Corporation, Woodland Hills, Calif.

Continuation of Ser. No. 153,452, May 27, 1980, abandoned. This application Feb. 28, 1985, Ser. No. 707,169

Int. Cl.⁴ B65H *17/38*

U.S. Cl. 226—74 **7 Claims**

1. For use in a printer or the like, a device for horizontally positioning and maintaining tension on a paper form or the like, comprising:

a first horizontal support shaft;

a first tractor support movably mounted to the support shaft;

a second tractor support movably mounted to the support shaft;

first adjustment means for horizontally displacing the first tractor support;

second adjustment means for horizontally displacing the second tractor support;

control means for selectively controlling the first and second adjustment means so as to:

(a) move the first tractor support individually, or

(b) move the first and second tractor supports in tandem;

a second horizontal support shaft spaced below the first support shaft;

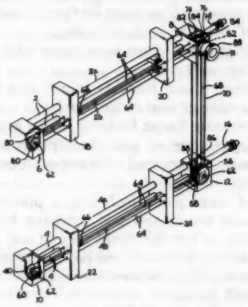
a third tractor support movably mounted to the second support shaft below the first tractor support;

a fourth tractor support movably mounted to the second support shaft below the second tractor support;

third adjustment means for horizontally displacing the third tractor support;

fourth adjustment means for horizontally displacing the fourth tractor support;

a coupling mechanism connecting the first adjustment means with the third adjustment means and the second adjustment means with the fourth adjustment means, whereby the first tractor support will move in tandem with the third tractor support and the second tractor support will move in tandem with the fourth tractor support; and



alignment means for vertically aligning and realigning the first and third tractor supports and the second and fourth tractor supports to the same horizontal positions, respectively, said alignment means including stop means, one located near each end of each support shaft and vertically aligned with the stop means at the corresponding end of the other support shaft, said stop means for abutting the tractor supports and halting their displacement along the support shafts, said adjustment means including means for enabling independent movement of the first tractor support with respect to the third tractor support and independent movement of the second tractor support with respect to the fourth tractor support despite the operation of the coupling mechanism, wherein the tractor supports are vertically aligned by displacing them to abut their corresponding stop means.

4,546,909

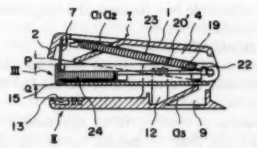
STAPLER

Yoshiyuki Ebihara, Tokyo, Japan, assignor to Etona, Co., Ltd., Tokyo, Japan

Filed Jan. 17, 1984, Ser. No. 571,533

Int. Cl.⁴ B25C *5/11*

U.S. Cl. 227—120 **5 Claims**



1. A stapler having a base, a staple magazine hinged to the base, a magazine follower arranged in the staple magazine, and a guide body positioned over the staple magazine and hinged to the base, said stapler comprising:

at least one first punched-out means, extending between the guide body and a top surface of the staple magazine, for absorbing elastic stress created between the guide body and the staple magazine when the stapler is operated; and

at least one second punched-out means, extending between the base and a bottom surface of the staple magazine, for absorbing elastic stress created between the base and the staple magazine when the stapler is operated.

4,546,910

ACTIVE CLINCHERS AND WIRE STITCHERS INCORPORATING SAME

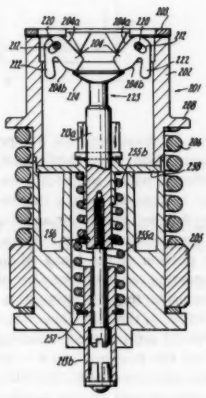
Jozef P. M. Logtens, Meerlo, Netherlands, assignor to Xerox Corporation, Stamford, Conn.

Filed Jul. 5, 1983, Ser. No. 511,033

Claims priority, application United Kingdom, Jul. 7, 1982, 8219713

Int. Cl.⁴ B25C *7/00*

U.S. Cl. 227—155 **5 Claims**



1. A stitcher device having a frame, a support surface on said frame for supporting an article to be stapled, a clincher ear mounted below said support surface, means pivotally mounting the ear on the frame, and an actuator mounted on said frame to engage and rotate the ear for bending a staple leg, the improvement wherein the means for pivotally mounting the clincher ear, upon engagement by the actuator imparts a generally perpendicular movement of the ear to the support surface following the end part of the rotational movement of the ear.

4,546,911

HEAT-SEALABLE COATED PAPER CONTAINER AND METHOD OF MANUFACTURE

Gerhard Clauss, Donzdorf, Fed. Rep. of Germany, assignor to Michael Hoerauf Maschinenfabrik GmbH & Co KG, Fed. Rep. of Germany

Filed Mar. 9, 1983, Ser. No. 473,714

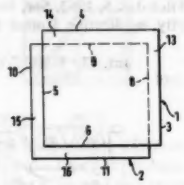
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1982, 3208682; Jul. 30, 1982, 3228437

Int. Cl.⁴ B65D *3/22, 13/04*

U.S. Cl. 229—5.6 **16 Claims**

1. A paper container of heat-sealable coated surface protected material comprising a wound container wall means and a container bottom means connected therewith, said container wall means being formed of a plurality of blank means bonded to one another, one of said blank means forming an inner wall means of said container and including a foldable portion projecting beyond a respective edge of another blank means, said

another blank means forming an outer wall means, said another blank means forming an outer wall means and including a foldable portion extending beyond a respective edge of said inner wall means, said foldable portion of the inner wall means being foldable outwardly to cover off the respective edge associated therewith, said foldable portion of the outer wall means being foldble inwardly to cover off the respective edge associated therewith of said inner wall means, said foldable portions of said inner wall means and said outer wall means forming an area of overlap when said container wall means is wound wherein said covered off respective edge of said inner wall means and said covered off respective edge of said outer wall means are disposed within said area of overlap and spaced a distance relative to one another, whereby said container wall means is sealed inside and outside.



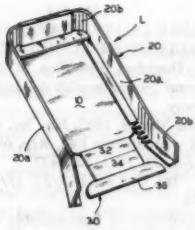
13. A method for manufacturing a paper container of double-walled construction from heat-sealable coated surface-protected cardboard which includes a wound container wall and a container bottom connected therewith, comprising the steps of placing finished blanks for an inner wall and an outer wall flat and one above the other in such a manner that a projecting rim portion of the blank of the inner wall and a projecting rim portion of the blank of the outer wall will result, folding over the projecting rim portions in such a manner that the respective edges of the blank beyond which the respective rim portions extend are covered, winding the double-walled blank with folded rim portions into a container wall in such a manner that the edges covered by the folded over rim portions are staggered with respect to one another within an area of overlap formed when the double-walled blank is wound, and securing a bottom to an open end of the wound container wall.

4,546,912

CARTON LID WITH ROUNDED CORNERS

John D. Desmond, Philadelphia, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Jan. 30, 1985, Ser. No. 696,393
Int. Cl.⁴ B65D *5/20*
U.S. Cl. 229—30 **7 Claims**



1. A liquid-tight carton lid having a flat top wall and having flat side and end walls joined to each other by rounded corners, said lid being formed from a unitary blank of foldably sheet material such as coated paperboard and comprising:

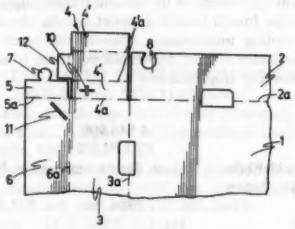
(a) a top wall panel having pairs of opposed parallel, straight side and end edges joined by rounded corner edges;
(b) a pair of opposed side walls having center portions foldably joined at upper edges to respective side edges of said top wall panel and extending downwardly therefrom;
(c) said side walls having end portions extending beyond said center portions under said top wall panel corner and end edges into overlapping relation with each other;
(d) a pair of opposed end walls joined to respective end edges of said top wall panel and enclosing related side wall end portions;
(e) each of said end walls including;
  (i) an outer panel foldably joined at its upper edge to an end edge of said top wall panel;
  (ii) an inner panel foldably joined at a lower edge to a lower edge of said outer panel;
  (iii) a retaining flange foldably joined at an upper edge of said inner panel and being folded inwardly and secured with respect to an inner surface of said top wall panel;
(f) each of said side walls including:
  (i) an outer panel joined at an upper edge to a side edge of said top wall panel;
  (ii) an inner panel foldably joined at a lower edge to a lower edge of said outer panel;
  (iii) a retaining flange foldably joined at an upper edge to an upper edge of said inner panel and being folded inwardly and secured with respect to an inner surface of said top wall panel;
  (iv) said inner panel including a plurality of vertically disposed scores and said retaining flange including a plurality of notches in the area of said carton corner to permit said side wall end portion to be curved around the corner edge between the side and end edges of said top wall panel;
(g) said side wall end portions being interposed between and secured with respect to the outer and inner panels of the related end walls.

4,546,913

REINFORCED CORNER INTERLOCK ON TRAY

Carmen S. Castillo, Miramar, 22, Gandia (Valencia), Spain

Filed Nov. 18, 1983, Ser. No. 553,396
Claims priority, application Spain, Jul. 8, 1983, 273.423[U]
Int. Cl.⁴ B65D *5/22*
U.S. Cl. 229—33 **4 Claims**



1. A collapsible box formed of a single cardboard sheet, said box comprising:
a rectangular bottom panel;
side panels extending from opposite sides of said bottom panel and bent to extend vertically therefrom along respective parallel first fold lines;
end panels extending from opposite ends of said bottom panel and bent to extend vertically therefrom along respective parallel second fold lines extending transverse to said first fold lines;
corner flaps extending from ends of each said end panel and bent with respect thereto along respective vertical third fold lines;

each said corner flap comprising plural panels bent with respect to each other along respective vertical fourth fold lines extending parallel to the respective third fold line, thus forming a triangular reinforcement of a corner formed by respective said side and end panels, one of said panels of each said corner flap being disposed adjacent the respective said end panel;

each said end panel having extending therefrom a top panel bent with respect thereto to extend horizontally therefrom over tops of respective said reinforcements along respective fifth fold lines extending parallel to said second fold lines;

end flaps extending from ends of each said top panel and bent with respect thereto to extend downwardly therefrom along respective sixth fold lines extending transverse to said fifth fold lines;

each said side panel having in end portions thereof upwardly facing cut-outs;

each said end flap having extending downwardly therefrom an extension of a shape complementary to and fitting within a respective said cut-out;

each said corner flap having formed in said one panel a first slit, each said extension partially fitting into a respective said first slit;

each said top panel having formed in end portions thereof second slits; and

each said corner flap having extending from one of said panels thereof a tongue, each said tongue fitting into a respective said second slit.

4,546,914

INTEGRAL THREE-PLY STRAP HANDLE

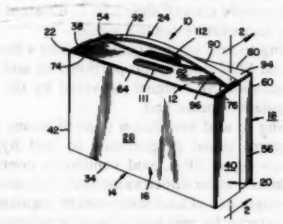
Harry I. Roccaforte, Western Springs, Ill., assignor to Champion International Corporation, Stamford, Conn.

Filed Sep. 16, 1983, Ser. No. 532,836

The portion of the term of this patent subsequent to Apr. 5, 2000, has been disclaimed.

Int. Cl.⁴ B65D *5/46*

U.S. Cl. 229—52 B **6 Claims**



1. A carton comprising top and bottom walls;

front, back and side walls connecting said top and bottom walls;

said top wall having inner and outer panels extending from said front and back walls, respectively, and being overlapped and secured together;

first and second side flaps extending from opposite side edges of said outer top panels and secured to the inside of said side walls;

an integral portion of said outer top panel being twice bent back upon itself to form inner, intermediate and outer elongated handle panels foldably connected together, said handle panels extending substantially parallel to and equally spaced from the top edges of said front and back walls and substantially perpendicular to said side walls with at least a portion of at least one of said handle panels including a portion of said first and second side flaps;

said outer handle panel being defined by a cut score line formed in said outer top panel which extends entirely across the length of said outer top panel and includes a side portion substantially parallel to said top edges of said front and back walls and end portions which flare at an angle with respect to said mid portion and extend partially across each of said side flaps, and by handle fold line formed in said outer top panel which extends parallel to the mid portion of said score line and across the entire length of said outer top panel and said side flaps and is located between said score line and the top edge of said front wall;

said inner handle panel being defined between said handle fold line and by said cut score line of said outer top panel;

said intermediate handle panel being defined by a panel positioned between said inner and outer handle panels and between said handle fold line and said cut score line, said intermediate handle panel being foldably connected to said inner handle panel, said intermediate handle panel underlying and being secured to said outer handle panel; and

wherein openings are formed in said inner top panel and said side flaps coupled thereto spanning junctures there between and underlying said handle panels.

4,546,915

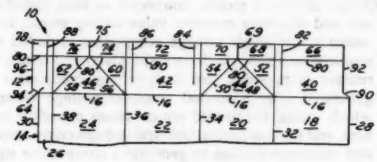
IN-FOLDED FIN SEAL END CLOSURE

Robert E. Lisiecki, Farmington Hills, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Apr. 5, 1985, Ser. No. 720,314

Int. Cl.⁴ B65D *5/72*

U.S. Cl. 229—17 G **5 Claims**

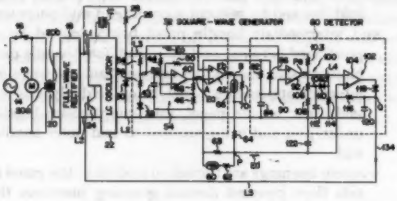


1. In a blank for constructing a container adaptable to being folded into a flat end container, wherein the blank includes five body portion panels interconnected by longitudinal score lines, five end closure panels connected via a first row of lateral score lines to respective ends of the body portion panels and separated by said longitudinal score lines; said five end closure panels including two panels having triangular panels respectively connected to the ends of two alternate body portion panels, and inner closure panels respectively connected to the ends of the other three alternate body portion panels; a pair of additional triangular panels connected via diagonal score lines to the opposite sides of each of said triangular panels; full width sealing panels respectively connected via a second row of lateral score lines to said inner closure panels; and a pair of sealing panels respectively connected via said second row of lateral score lines to each pair of additional triangular panels; the improvement comprising supplementary score lines formed on the edge portions of the full width sealing panels and inner closure panels located adjacent opposite sides of each pair of aligned additional triangular panels and sealing panels, parallel to said longitudinal score lines.

4,546,916
HUMIDIFIER

Hajime Tsuaki, Kani, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 1, 1984, Ser. No. 585,163
Claims priority, application Japan, Mar. 15, 1983, 58-42742
Int. Cl.[4] G05D 22/00
U.S. Cl. 236—44 A 19 Claims



2. An apparatus for controlling ambient moisture, comprising:

moisture sensor means for outputting a sensor output signal in response to a source voltage, said output signal having a capacitor component and a resistor component which vary with changes in the ambient moisture;

source voltage generator means for supplying to said sensor a square-wave source voltage which alternately varies between first and second potentials at a predetermined period thereby constituting a pseudo AC source voltage, said generator means comprising,

first voltage generator means for generating a first square-wave voltage having a first amplitude, and

second voltage generator means for generating a second square-wave voltage of a second amplitude, said first and second amplitudes being added together and with one of them used as a reference potential to produce said pseudo AC source voltage;

objective moisture value setting means for generating a reference voltage representative of an objective value of ambient moisture;

moisture detection means, connected to said sensor means and said objective moisture value setting means, for indicating a first stable voltage component included in said sensor means and which corresponds to said sensor means resistor component, said first voltage component being generated after a second transient voltage component which varies due to said sensor means capacitor component, and for comparing said first voltage component with said reference voltage to generate a comparison signal in accordance with their respective voltage magnitudes; and

moisture control means, connected to said moisture detection means, for controlling ambient moisture in response to said comparison signal.

4,546,917
TEMPERATURE AND HYGROMETRY CONTROL AND REGULATION INTERFACE

Yves Cormary, Ville St. Jacques, and Christian Nicolas, Samoreau, both of France, assignors to Service National Electricite de France, France

Filed Aug. 31, 1984, Ser. No. 646,902
Claims priority, application France, Sep. 6, 1983, 83 14188
Int. Cl.[4] G05D 22/00
U.S. Cl. 236—44 C 3 Claims

1. In a temperature and hygrometry control and regulation interface cooperating with:

a. temperature regulation means producing a temperature regulation signal SRT as a function of the difference existing between a temperature control signal SCT and a temperature measurement signal SMT,

b. hygrometry regulation means producing a hygrometry regulation signal SRH as a function of the difference existing between a hygrometry control signal SCH and a hygrometry measurement signal SMH,

c. heating control means functioning in response to a heating control signal SCC, and

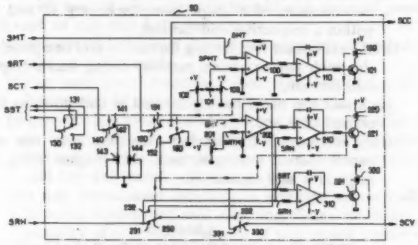
d. ventilation control means functioning in response to a ventilation control signal SCV,

the improvement comprising:

means whereby said control interface is adapted to pass from a summer position, when said temperature measurement signal SMT is above a predetermined changeover of control value, and a winter position, when said temperature measurement signal is below said predetermined change of control value;

means whereby said control interface permits in said summer position:

a. delivering to said temperature regulation means a summer temperature control signal SCT, and



b. delivering to said ventilation control means a ventilation control signal SCV inversely proportional to said temperature regulation signal SRT delivered by means of said temperature regulation means; and

means whereby said control interface permits, in said winter position:

a. delivering to said temperature regulation means a winter temperature control signal SCT, different from said summer temperature control signal,

b. delivering to said heating control means a heating control signal SCC directly proportional to said temperature regulation SRT signal delivered by the temperature regulation means and

c. delivering to said ventilation control means a ventilation control signal proportional to said hygrometry regulation signal SRH, said ventilation control signal being limited to an upper value inversely proportional to the amplitude of said temperature regulation signal SRT produced by said temperature regulation means.

4,546,918
CONTROL DEVICE WITH POSITIVE TEMPERATURE COEFFICIENT IMPEDANCE FOR LIMITING DISSIPATED POWER

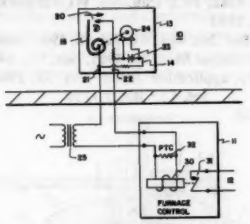
John E. Bohan, Jr., Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 29, 1984, Ser. No. 625,484
Int. Cl.[4] F23N 5/20
U.S. Cl. 236—46 R 5 Claims

1. An improvement in a high impedance control device having a source of power and adapted to be connected to a temperature conditioning apparatus for supplying temperature conditioned medium to a space and adapted to be connected to a space thermostat switch device having a circuit requiring a small "trickle" current for maintaining the circuit active during the open cycle of the thermostat switch wherein during a close cycle of the thermostat switch high current flow in the control device results in a high amount of heat dissipation in the control device, the improvement comprising,

a positive temperature coefficient impedance means, and

means connecting said positive temperature coefficient impedance means in said high impedance control device so that upon said switch device being open a low input impedance exists at said control device to produce a significant



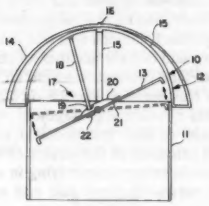
trickle current and upon said switch device being closed said impedance means increases in temperature due to current flow and its impedance increases to reduce said current flow and to reduce the wattage dissipated in the control device.

4,546,919

VENTILATOR ACTUATOR

David W. Wells, Brisbane, Australia, assignor to Jennifer Margaret Pierce; Daniel Graham Wells and Gordon William Wells, all of Queensland, Australia

Filed Apr. 16, 1984, Ser. No. 600,385
Claims priority, application Australia, Apr. 21, 1983, PF8999
Int. Cl.[4] G05D *23/10*
U.S. Cl. 236—48 R **9 Claims**



1. An actuator for a ventilator having a ventilating opening and at least one closure member for closing the opening, said actuator comprising a diaphragm directly securable to the closure member to form a reservoir between said diaphragm and the member for containing a heat responsive fluid, an actuating member, one end of which is secured to said diaphragm, the other end of which, in use, is fixed to an anchor point, said diaphragm normally being retracted at a first temperature and extended at a second elevated temperature, said diaphragm in its retracted position being substantially saucer shaped or concave when viewed from above.

4,546,920

SONIC WATER JET NOZZLE

Robert H. Torgersen, Canoga Park, Calif., assignor to Automation Industries, Inc., Greenwich, Conn.

Filed Oct. 21, 1983, Ser. No. 544,398
Int. Cl.[4] B05B *17/06*
U.S. Cl. 239—102 **9 Claims**

1. Sonic liquid jet nozzle, comprising:

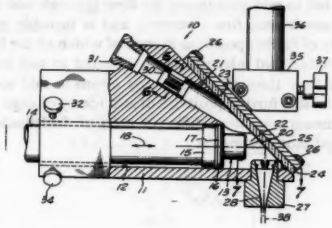
a housing;

a first passageway within said housing having an external opening for interconnection with a source of pressurized liquid;

sonic energy reflector means having a surface in communication with the first passageway;

a second passageway in said housing communicating with said first passageway and said reflector means;

a source of sonic energy located in said second passageway for directing sonic energy onto said reflector means surface; and



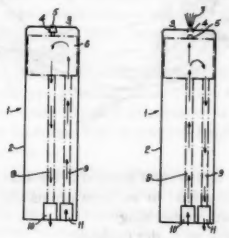
a nozzle body with a passageway aligned with the direction of reflected sonic energy extending therethrough mounted on said housing for receiving pressurized liquid and reflected sonic energy from said reflector means and for emitting the liquid and sonic energy exteriorly of the housing.

4,546,921

LIQUID FUEL BURNER

Wallace McCormack, Southampton, United Kingdom, assignor to Credfeld Camtore Limited, Portsmouth, United Kingdom

PCT No. PCT/GB82/00128, § 371 Date Dec. 27, 1982, § 102(e) Date Dec. 27, 1982, PCT Pub. No. WO82/03906, PCT Pub. Date Nov. 11, 1982
PCT Filed Apr. 29, 1982, Ser. No. 456,077
Claims priority, application United Kingdom, Apr. 30, 1981, 8113351
Int. Cl.[4] B05B *9/00*
U.S. Cl. 239—125 **5 Claims**



1. A liquid fuel burner comprising:

a valve housing,

a burner unit including atomiser means for discharging liquid fuel from the burner unit, ducting means for conveying said liquid fuel between said valve housing and said atomiser means and atomiser control valve means movable to a first position in response to flow of said liquid fuel in a first direction through said ducting means to close said atomiser means and return said liquid fuel from said atomiser means to said valve housing and movable to a second position in response to flow of said liquid fuel in a second direction through said ducting means to open said atomiser means to allow at least some of the liquid fuel conveyed to said atomiser means to be discharged therefrom and to return any surplus liquid fuel to said valve housing,

means comprising inlet and outlet passages in said valve housing, for conveying said liquid fuel into and from said valve housing, and

rotary change-over valve means in said valve housing which communicates with said ducting means and with said inlet and outlet passages and which is turnable into a first position in which all the liquid fuel entering said inlet passage is directed to said burner unit for flow through said ducting means in said first direction, and is turnable into a plurality of further positions in each of which all the liquid fuel entering said inlet passage is directed to said burner unit for flow through said ducting means in said second direction, said further positions of said rotary change-over valve means providing different rates of fuel discharge from said atomiser means.

4,546,922

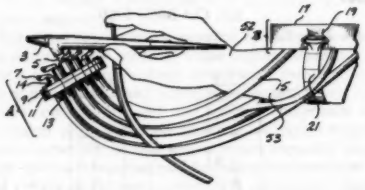
MULTI-COLORED AIRBRUSH ATTACHMENT SYSTEM HAVING A SPIRAL MIXING CHAMBER AND A WRIST/ARM-MOUNTED PAINT RESERVOIR

Steve P. Thometz, 20466 W. Cullen Dr., Topanga Canyon, Calif. 90290

Continuation-in-part of Ser. No. 279,944, Jul. 2, 1981, abandoned. This application Jul. 22, 1983, Ser. No. 508,673

Int. Cl.⁴ B05B 7/00

U.S. Cl. 239—304 **10 Claims**



1. A compact, lightweight apparatus for selectively supplying multi-colored paints to an airbrush having a paint inlet port, said apparatus comprising:

a housing having an outlet opening;

a plurality of individual inlet passageways, each connectable to a separate fluid supply;

selectively adjustable valve means disposed in fluid flow communication with each of said inlet passageways to meter the volume of fluid flowing therethrough; and,

mixing chamber means for thoroughly mixing the different fluids flowing through the inlet passageways and directing said mixture to the housing outlet opening, said mixing chamber means comprising a plurality of spiral mixing passageways each interconnecting in fluid flow communication a corresponding inlet passageway with the outlet opening, said spiral mixing passageways initially disposed in generally parallel relationship to each other and then converging with each other to form a single common passageway in communication with the outlet opening to cause the fluids carried therein to thoroughly mix with each other prior to reaching the outlet opening.

4,546,923

NOZZLE FOR ATOMIZING FLUIDS

Tadashi Ii, 24-13, Omori Higashi 1-chome, Ota-ku, Tokyo 143, Japan

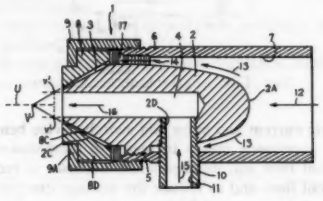
PCT No. PCT/JP81/00061, § 371 Date Jul. 28, 1982, § 102(e) Date Jul. 28, 1982, PCT Pub. No. WO82/01831, PCT Pub. Date Jun. 10, 1982

Continuation of Ser. No. 403,741, Jul. 28, 1982, abandoned. This PCT application Mar. 24, 1981, Ser. No. 644,646

Claims priority, application Japan, Nov. 29, 1980, 55-170286

Int. Cl.⁴ B05B 7/10

U.S. Cl. 239—406 **7 Claims**



1. A nozzle, comprising:

a nozzle body having a generally planar end surface thereon and having means defining a passageway therein which communicates with a generally circular opening provided in said end surface, a portion of said passageway adjacent said opening being a frustoconical surface which tapers toward said end surface;

a member disposed in said passageway, having a generally planar end surface which is approximately flush with said end surface on said nozzle body, having a frustoconical surface thereon which converges toward said end surface thereof and is disposed against said frustoconical surface on said nozzle body, and having means defining a cylindrical passageway which extends into said member from and perpendicular to said end surface thereof coaxial with said frustoconical surface thereon, wherein an apex of an extension of said frustoconical surface on said member lies on an axis of said cylindrical passageway, the intersection of said extension of said frustoconical surface on said member and an extension of the surface of said cylindrical passageway therein being a circle lying in a plane parallel to and spaced outwardly from said end surface on said member;

means defining a plurality of angularly spaced grooves in one of said frustoconical surfaces, each said groove having two spaced side walls and a bottom wall which all converge to a point located on said circle, said side walls each following a logarithmic spiral, wherein a center line of each said groove provided intermediate said side walls thereof is substantially an arc having a center point which is spaced farther from said apex of said frustoconical surface than from said circle; and

supply means for supplying a pressurized first fluid to said passageway in said nozzle body and for supplying a second fluid to said passageway in said member, said pressurized first fluid flowing through said grooves in said frustoconical surface and being emitted from said nozzle as a spiral flow which produces a vacuum which causes said second fluid to be drawn out of said passageway in said member and to be atomized.

4,546,924

FUEL INJECTOR

Knut L. Winquist, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

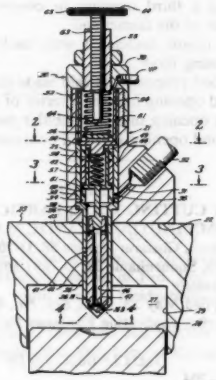
Filed Nov. 25, 1983, Ser. No. 554,968

Int. Cl.⁴ F02M 45/00

U.S. Cl. 239—533.4 **21 Claims**

1. A fuel injector, comprising a valve body having a cavity

extending longitudinally therein, an inlet through which fuel may be supplied to the cavity, a valve seat at one end of the cavity, and a plurality of circumferentially spaced outlets which connect the seat with the exterior of the valve body for injecting fuel into a cylinder of an internal combustion engine, a valve member extending longitudinally within the cavity and having an end surface facing and conforming to the valve seat, said valve member having an opening therein which connects with the cavity, and circumferentially spaced outlets which connect the opening with the end surface of the valve member,



means yieldably urging the end surface of the valve member against the valve seat, and means responsive to rising fuel pressure in the cavity for rotating the valve member from a position in which the outlets in the valve member are out of register with the outlets of the valve body to a position in which the outlets of the valve member and valve body are in register, and to decreasing fuel pressure in the cavity for rotating the valve member from the position in which the outlets in the valve member are in register with the outlets of the valve body to a position in which the outlets in the valve member are out of register with the outlets in the valve body.

4,546,925

SUPERMICRONIZED PROCESS FOR COAL COMMINUTION

Clifford L. Spiro, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 9, 1983, Ser. No. 530,179
Int. Cl.⁴ B02C *19/00*
U.S. Cl. 241—1 **20 Claims**

1. A method for comminution of raw coal to produce coal particles having particle sizes in the range of one micron and below comprising:

mechanically fracturing said coal to a first range of particle sizes;

adding a swelling agent to said fractured coal so as to increase the size of said coal particles;

further mechanically fracturing said swelled coal particles;

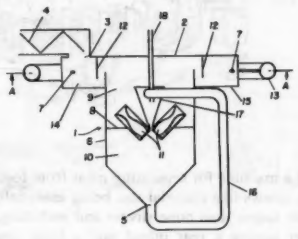
removing said swelling agent from said fractured coal so as to further reduce the particle size range of said coal.

4,546,926

PRESSURE-CHAMBER GRINDER

Jouko Niemi, SF-33960 Pirkkala 6, Finland

PCT No. PCT/FI82/00057, § 371 Date Jun. 21, 1983, § 102(e) Date Jun. 21, 1983, PCT Pub. No. WO83/01915, PCT Pub. Date Jun. 9, 1983
PCT Filed Nov. 17, 1982, Ser. No. 518,800
Claims priority, application Finland, Nov. 27, 1981, 813812
Int. Cl.⁴ B02C *19/06, 23/12*
U.S. Cl. 241—39 **10 Claims**



1. A pressure chamber grinder for grinding material into ultrafine grain particles by means of a grinding gas, comprising:

a housing defining a space and having a mantle face extending around said space;

a partition wall connected in said housing dividing said housing space into a pre-grinding chamber and a main grinding chamber and extending substantially transversely to said mantle face;

said housing including a portion defining a pregrinding portion having a cross-sectional area larger than said pre-grinding chamber, said pre-grinding portion being connected to said pre-grinding chamber;

material feed means connected to said housing and communicating with said pre-grinding portion for feeding a gas-tight plug of material to said pre-grinding portion;

a plurality of tangentially directed nozzles, uniformly spaced around said mantle face and connected to said housing for supplying grinding gas under pressure to said pre-grinding portion of said housing;

a pair of concentric walls connected to said housing for separating said pre-grinding portion from said pre-grinding chamber, each of said concentric walls extending axially by at least one-half an overall height of said pre-grinding portion;

said housing having an outlet communicating with said main grinding chamber for discharging at least partially ground material from said main grinding chamber;

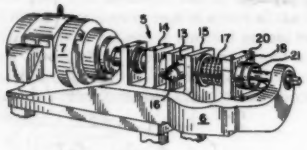
at least two laval nozzles extending through said partition wall extending toward a centerline of said main grinding chamber and forming an angle with each other, said laval nozzles communicating with said pre-grinding chamber and with said main grinding chamber and structured to pass material with grinding gas from said pre-grinding chamber to said main grinding chamber at supersonic speed, said main grinding chamber including a grinding zone adjacent an outlet of each of said two laval nozzles at which material and grinding gas collide at supersonic speed, said grinding zone spaced from said outlet; and

a classifier connected to said housing outlet and having a classifier outlet for discharging material and grinding gas into said grinding zone, said classifier separating a coarse fraction from a fine fraction of material which has been ground in said pre and main grinding chambers, supplying said coarse fraction to said grinding zone and supplying said fine fraction out of said housing.

4,546,927
MEAT SEPARATING MEANS

James A. Bloome, Blue Grass, and Jimmie Shaw, Davenport, both of Iowa, assignors to The Kartridg Pak Co., Davenport, Iowa

Filed Mar. 30, 1984, Ser. No. 595,429
Int. Cl.[4] B02C *23/16*
U.S. Cl. 241—74 7 Claims

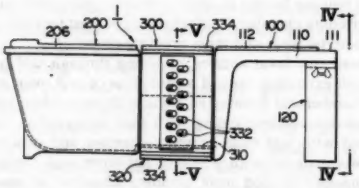


1. In a machine for separating meat from feed material containing sinews-like material and being essentially free of bone particles larger than bone slivers and including, a foraminous cylinder having a rear infeed and a front discharge end, a conveying auger co-axially rotatable at relatively high speed within said foraminous cylinder and having a rigid non-yielding flite thereon, and valve means at the discharge end of said auger providing a restricted orifice through which compacted sinews, sinew-like materal and bone slivers discharge, there being a clearance between the outer diameter of said flite and the inside diameter of said foraminous cylinder sufficient to prevent appreciable direct contact between the crest of said flite and the interior surface of said foraminous cylinder, the improvement which comprises at least the radial outermost portion of the auger flite being a wiper strip mounted on the crest of said flite and formed of a material which is non-injurious to the inner surface of said foraminous cylinder when in wiping engagement therewith and said auger is rotating at relatively high speed.

4,546,928
FOOD PROCESSOR

Hajime Suzuki, 13-44, Ajiyoshihakusancho-1-chome, Kasugai-shi, Aichi-ken, Japan

Filed Apr. 9, 1984, Ser. No. 598,196
Claims priority, application Japan, Aug. 31, 1983, 58-134946[U]
Int. Cl.[4] A47J *43/06*
U.S. Cl. 241—95 11 Claims

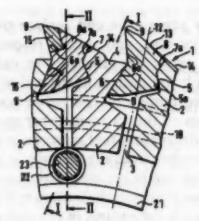


1. A food processor, comprising:
a horizontal tubular member having a first opening in the top thereof and first and second ends;
guide means attached to the first end of said tubular member, comprising handle means and a guide surface on which food to be processed may travel in a direction substantially parallel to the longitudinal axis of said tubular member;
a container attached to the second end of said tubular member, having a second opening in communication with said tubular member, said guide means and said container being connected by said tubular member;
rotational surface means on said tubular member;
a hollow frame enclosing said tubular member, comprising:
wall means having a circular inner edge for engaging said rotational surface means to allow rotation of said frame in a direction substantially perpendicular to the longitudinal axis of said tubular member, around an axis substantially parallel to the longitudinal axis of said tubular member;
a plurality of plates on the periphery of said frame, each having a third opening in communication with the interior of the frame; and
a blade means associated with each third opening for processing food;
whereby food processed by said blade means passes through said third opening into the interior of said frame, through said first opening into said tubular member, and through said second opening into said container.

4,546,929
ROTARY CUTTING TOOL, PARTICULARLY FOR COMMINUTING PLASTIC MATERIAL

Rudolf P. Fritsch, Goslarer Strasse 58, D-7000 Stuttgart 31, and Hans Hench, Sonnenhalde 31, D-7851 Inzlingen, both of Fed. Rep. of Germany

Filed May 23, 1983, Ser. No. 496,882
Claims priority, application European Pat. Off., Jun. 4, 1982, 82104898.0
Int. Cl.[4] B02C *18/18*
U.S. Cl. 241—294 20 Claims



1. Rotary cutting tool, particularly for comminuting plastic material, defining an essentially cylindrical structure (1), said tool having
a plurality of or strip-like cutting bars (8, 8*a*) located at the circumference of the structure at essentially uniform circumferential spacing, removably secured to the structure, and extending in axial direction over at least a portion of the structure;
two facing axially positioned clamping disks (19) axially clamping the cutting bars to said structure,
said tool comprising,
a plurality of axially extending part-essentially segmental clamping elements (2, 2*a*) located for limited radial movement and positioned between the cutting bars (8, 8*a*) and forming, with the cutting bars, a serrated circular cylindrical surface,
said clamping elements having clamping portions (4) including first and second clamping element engagement surfaces (5*a*, 6*a*) between which first and second matching cutting bar engagement surfaces (5, 6) of sequential cutting bars are clamped,
said first and second engagement surfaces being non-parallel with respect to each other and forming an interlock between the clamping element engagement surfaces (5*a*, 6*a*) and the cutting bar engagement surfaces (5, 6);
said clamping elements being formed with essentially conical surfaces at axial regions thereof;
said clamping disks (19) being formed with coaxial conical

surfaces (20) matching, and in engagement with the conical surfaces (18) of the clamping elements and oriented for inward radial movement of the clamping elements (2, 2a) upon mutual axial compression of the clamping disks towards each other;

and means (23) for drawing the clamping disks (19) towards each other, hence causing radial inward movement of the clamping elements, and hence clamping of the cutting bars (8, 8a) between the clamping elements to define said serrated surface of said structure.

4,546,930

CONTINUOUS WEB WINDER

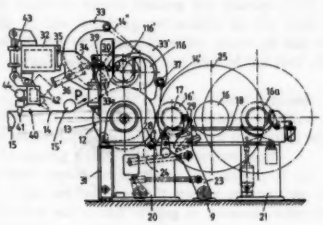
Günter Rohde, Zang; Dieter Holzinger, Herbrechtingen, and Udo Grossmann, Heidenheim, all of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed Jun. 7, 1984, Ser. No. 618,194

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1983, 3321213

Int. Cl.⁴ B65H *19/26, 19/28*

U.S. Cl. 242—56 R 17 Claims



1. An apparatus for winding a continuous web, such as paper, cardboard and the like, on reel-spools including means for exchanging a full roll with an empty reel-spool rotating at a speed approximately the same as the speed of web travel, said exchanging means supporting the empty reel-spool in a ready position near the web being wound on the full roll; a brake for slowing the rotation of the full roll; and a blower device arranged substantially between the empty reel-spool and the full roll for forming a portion of the web into a loop; characterized in that:

a sickle-shaped catch lever is disposed near the web and has one end portion thereof pivotally mounted on the web entrance side of the empty reel-spool at the ready position, said sickle-shaped catch lever being pivotal between a rest position wherein said sickle-shaped catch lever is spaceda-part from the empty reel-spool and a catch position wherein said sickle-shaped catch lever is peripherally disposed about a portion of the empty reel-spool as yet uncovered by the advancing web,

said sickle-shaped catch lever having on its opposite end portion a catch means for engaging the web loop when said catch lever is at the catch position, said catch lever disposing the web around a portion of the circumference of the empty reel-spool when pivoting from the catch position to the rest position.

4,546,931

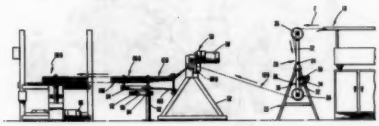
METHOD AND APPARATUS FOR COILING A CONTINUOUS STRING OF MOLDED ITEMS ABOUT A VERTICAL AXIS

C. Bruce Dawson, Winchester, Va., assignor to O'Sullivan Corporation, Winchester, Va.

Continuation-in-part of Ser. No. 481,825, Apr. 4, 1983, Pat. No. 4,496,113, which is a continuation-in-part of Ser. No. 316,033, Oct. 28, 1981, Pat. No. 4,445,836. This application Jun. 18, 1984, Ser. No. 621,794

Int. Cl.⁴ B65H *17/02, 25/04, 75/02*

U.S. Cl. 242—67.2 18 Claims



1. Apparatus for winding a plurality of continuous strings of items which are formed in a mold, said apparatus comprising:

a first tensioning means for pulling said strings from said mold and including:

a first movable member engaging said strings;

first biasing means for urging said first movable member in a first direction to pull said strings simultaneously from the mold and maintain a tension thereon;

first motor-driven drive means disposed downstream of said first tensioning means and being engageable with said strings to simultaneously advance said strings to produce movement of said first movable member in a second direction opposite said first direction;

first switch means arranged adjacent said first movable member for activating said first drive means in response to the pulling of preselected amounts of said strings from the mold by said first movable member and for deactivating said drive means in response to said preselected amounts of said strings being advanced by said first drive means;

a plurality of second tensioning means disposed downstream of said first drive means for engaging respective ones of said strings;

each said second tensioning means comprising:

a second movable member engaging its associated string;

second biasing means for urging said second movable member in a third direction to take-up its associated string as the latter is advanced by said first drive means and to maintain tension on such string;

a plurality of winding reels respectively associated with said plurality of second tensioning means, each reel being rotatable about a generally vertical axis and including:

a table upon which the associated string is supported as it is being wound into a coil upon said reel; and

second drive means for rotating said reel to advance the associated string and produce movement of the associated second movable member in a fourth direction opposite said third direction;

a plurality of second switch means respectively disposed adjacent said second movable members for activating said second drive means of the associated reels in response to the drawing of a predetermined amount of the associated string by such second movable member, and for deactivating said second drive means of the associated reel in response to said predetermined amount of the associated string being wound by the reel.

4,546,932

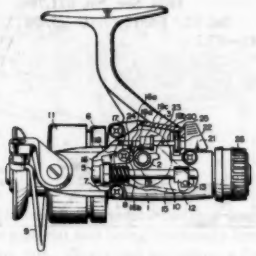
SPINNING TYPE FISHING REEL WITH SELECTABLY CLICKING OR NON-CLICKING RATCHET MECHANISM

Hatsutaro Ohmori, Tokyo, Japan, assignor to Kabushiki Kaisha Ohmori Seisakusho, Kawagoe, Japan

Filed Dec. 15, 1983, Ser. No. 561,885

Int. Cl.[4] A01K *89/01, 89/02;* F16D *63/00*

U.S. Cl. 242—84.21 R **3 Claims**



1. A spinning type fishing reel, comprising:

(a) a main body;

(b) a handle shaft rotatably supported in said main body;

(c) a spool cup shaft rotatably supported in said main body and driven from said handle shaft;

(d) a ratchet wheel mounted on said spool cup shaft;

(e) a ratchet pawl having first and second projections;

(f) a biasing means for biasing said ratchet pawl toward said ratchet wheel;

(g) when said ratchet pawl is pressed against said ratchet wheel, said ratchet wheel and said spool cup shaft being only able to rotate in a first direction, with said handle shaft rotating in a second direction; further comprising:

(h) a friction member having first and second projections, said friction member being rotatably and frictionally mounted on said handle shaft so that a certain frictional torque is required to be applied therebetween before mutual slippage occurs in either direction; and

(i) a control means having first and second pressure members for selectively, according to control by the user, performing any one of the following:

(i1) interfering with said friction member but free from interference with said ratchet pawl by pressing said control means first pressure member against said friction member first projection while preventing any pressure between said control means second pressure member and the said ratchet pawl first projection; or

(i2) being free from interference with both said friction member and said ratchet pawl by preventing any pressure between said control means first pressure member and said friction member first projection, and simultaneously preventing any pressure between said control means second pressure member and said ratchet pawl first projection; or

(i3) interfering with said ratchet pawl by pressing said control means second pressure member against ratchet pawl first projection;

(j) when said friction member is free from interference with said control means so that:

(j1) when said handle shaft is rotating in a third direction opposite said second direction, said friction member is free from engagement with said ratchet pawl; and

(j2) when said handle shaft is rotating in said second direction, said friction member engages said ratchet pawl to bias said ratchet pawl away from said ratchet wheel;

(k) when said control means first pressure member engages said friction member first projection, said friction member is displaced so that said friction member second projection is free from engagement with said ratchet pawl second projection;

(l) when said control means first pressure member is free from engagement with said friction member first projection, said friction member is rotatably carried by said handle shaft so that:

(l1) when said handle shaft is rotating in said second direction, said friction member second projection engages said ratchet pawl second projection; and

(l2) when said handle shaft is rotating in said third direction, said friction member second projection is free from engagement with said ratchet pawl second projection; and

(m) said ratchet pawl, when interfered with by said control means, being biased away from said ratchet wheel, and when either said ratchet pawl first or second projection is pressed, said ratchet pawl being displaced from said ratchet wheel against the action of said biasing means.

4,546,933

WEBBING RETRACTOR

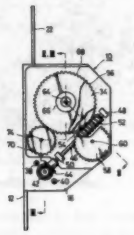
Shigeyasu Kanada; Shigeo Mizuno; Yoshio Nakano, and Yuji Nishimura, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Nov. 9, 1984, Ser. No. 670,358

Claims priority, application Japan, Nov. 11, 1983, 58-174657[U]

Int. Cl.[4] A62B *35/00;* B65H *75/48*

U.S. Cl. 242—107 **20 Claims**



1. A webbing retractor adapted for use in a seatbelt system for restraining an occupant of a vehicle by an occupant restraining webbing, which comprises:

(a) a resilient member, one end thereof being secured to a webbing takeup shaft secured with one end of the webbing, for biasing the takeup shaft in a direction of webbing winding;

(b) an actuator for moving the other end of the resilient member in the direction of webbing winding or in the direction of webbing unwinding;

(c) a first moving amount detector for detecting a moving amount of the one end of the resilient member;

(d) a second moving amount detector for detecting a moving amount of the other end of the resilient member; and

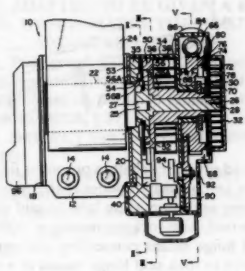
(e) drive control means connected to the actuator, for controlling the actuator to move the other end of the resilient member in the direction of webbing winding or webbing unwinding in response to a first detected value detected by the first moving amount detector and a second detected value detected by the second moving amount detector,

whereby a tension of the webbing can be made proper when the occupant wears the webbing.

4,546,934
WEBBING TENSION DEVICE

Yuji Nishimura; Akinori Fujiwara; Teruhiko Kawaguchi; Toshiaki Shimogawa, and Kazuo Sakakibara, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho and Nippon Soken, Inc., both of Aichi, Japan

Filed Jul. 24, 1984, Ser. No. 633,921
Claims priority, application Japan, Jul. 29, 1983, 58-140277
Int. Cl.[4] A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107 **20 Claims**



1. A webbing tension device adapted for use in a webbing retractor for protecting an occupant in an emergency situation of a vehicle, which comprises:

(a) first resilient means biasing a webbing takeup shaft supported rotatably to the webbing retractor and secured thereto with one end of an occupant restraining webbing in a direction of a webbing retraction,

(b) second resilient means biasing the takeup shaft in the direction of the webbing retraction in the emergency situation of the vehicle, a biasing force of the second resilient means being larger than that of the first resilient means;

(c) winding means including a worm wheel disposed coaxially with the takeup shaft and rotatable relative to the takeup shaft and a worm engaged with the worm wheel to rotate the worm wheel under reduction; and

(d) first clutch means transmitting a rotation of the worm wheel to the second resilient means against the biasing force thereof when the worm is rotated, whereby the second resilient means is wound up.

4,546,935
METHOD OF AND APPARATUS FOR PILING UP TAPES

Yasuo Yamada, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jun. 28, 1983, Ser. No. 508,877
Claims priority, application Japan, Jun. 29, 1982, 57-112198
Int. Cl.[4] B65H *55/00, 55/04*
U.S. Cl. 242—170 **13 Claims**

1. An apparatus for piling up elongate materials, comprising:

(a) a frame;

(b) a first crank disk positively rotatably mounted on said frame;

(c) a second crank disk positively rotatably mounted on said frame, said first crank disk being capable of making a plurality of revolutions per each revolution of said second crank disk;

(d) a first link having one end rotatably connected to said first crank disk;

(e) a second link having one end rotatably connected to said second crank disk;

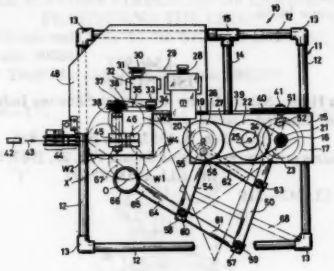
(f) a third link angularly movably connected to opposite ends of said first and second links;

(g) a fourth link angularly movably connected to said first and second links;

(h) said third link having an extension serving as a guide bar having a distal end;

(i) a discharge roll rotatably mounted on said frame for discharging the elongate materials successively; and

(j) a guide pipe universally movably supported on said frame

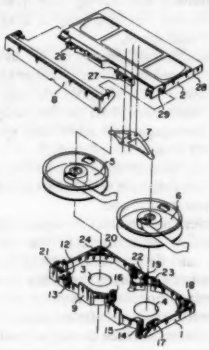


below said discharge roll and guided by said distal end for piling up the elongate materials in composite circular motions when said first and second crank disks are rotated.

4,546,936
MAGNETIC TAPE CASSETTE CASING

Masatoshi Okamura, and Toshihiko Ishida, both of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Mar. 14, 1984, Ser. No. 589,315
Claims priority, application Japan, Mar. 29, 1983, 58-44292[U]
Int. Cl.[4] G03B *1/04*; G11B *15/32*
U.S. Cl. 242—198 **1 Claim**



1. A magnetic videotape cassette, comprising:

a lower casing having front and bottom surfaces;

an upper casing having a top surface, said upper and lower casings being joined to define boundaries of said cassette;

tape reels positioned in said cassette;

openings only in said lower casing corresponding to centers of said tape reels for introduction of tape reel drive means;

a front protective cover pivotally connected to said upper casing, said front cover being pivotable between a closed position wherein said front surface and a portion of said upper casing adjacent thereto are covered thereby, and an open position;

first reference holes in said bottom surface adjacent said front surface, said first reference holes being in alignment with reference pins of a cassette deck; and

second reference holes in said upper casing and in coaxial alignment with first reference holes, said second reference

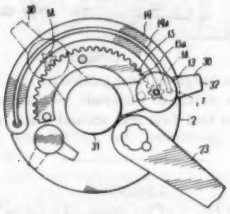
holes being positioned on said covered portion of said upper casing wherein dimensions of all structural elements of said upper and lower casings are determined with reference to said first and second reference holes, and wherein said first reference holes are larger than said second reference holes.

4,546,937

FISHING REEL

Noda Hideo, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Feb. 8, 1983, Ser. No. 464,885
Claims priority, application Japan, Feb. 25, 1982, 57-26856[U]
Int. Cl.⁴ A01K *89/00*
U.S. Cl. 242—219 **4 Claims**



1. A fishing reel comprising:
a pair of side frames;
a spool shaft supported rotatably and axially movably between said side frames;
a spool supported rotatably and not axially movably with respect to said spool shaft;
a drive mechanism for driving said spool shaft;
a drag mechanism for applying a drag resistance against rotation of said spool,
said drag mechanism engaging or disengaging by axial movement of said spool shaft, said drag mechanism engaging to transmit to said spool through a drag resistance rotation of said spool shaft produced by said drive mechanism and disengaging to allow said spool to freely rotate with respect to said spool shaft;
a drag lever supported rotatably to one of said side frames for axially moving said spool shaft to control an amount of said drag resistance; and
a fine adjustment mechanism for operating said drag lever to produce a fine adjustment in the amount of said drag resistance, said fine adjustment mechanism comprising a rotary member supported rotatably to said drag lever and having a rotary operating member, and a contact member which is fixed to said side frame supporting said drag lever and has a contact surface in contact with said rotary member, said rotary member being rotatably operable upon operation of said rotary operating member to finely change an angular position of said drag lever and enable a fine adjustment in said drag resistance.

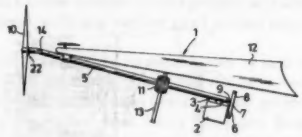
4,546,938

POWER UNIT FOR HANG-GLIDERS

Jerzy W. Kolecki, Grusåsgränd 82, S-122 22 Enskede 1, Sweden

Filed Sep. 22, 1982, Ser. No. 421,192
Int. Cl.⁴ B64D *35/00, 27/00*
U.S. Cl. 244—66 **4 Claims**

1. A power unit for a hang-glider or the like ultra-light air craft; said power unit comprising:
a combustion motor, a drive shaft, means connecting said combustion motor to one end of said drive shaft, a propeller shaft connected to the other end of the drive shaft and driven thereby, the improvement comprising a supporting tube mounting said combustion engine externally thereof, means for journalling said drive shaft internally of said supporting tube, means for connecting said supporting tube to said hang-glider at the location of the center of gravity common to the hang-glider and to said power unit with said supporting tube extending in the direction of the movement of said hang-glider, a sleeve concentrically surrounding said propeller shaft and means for journalling said propeller shaft within said sleeve, a flexible coupling comprising a rubber body having a first end fixed to the other end of said drive shaft, and a second end fixed to one



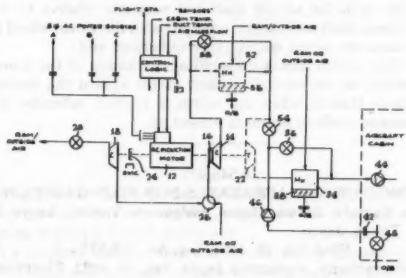
end of said propeller shaft, a propeller fixedly mounted to the other end of said propeller shaft, opposed hinge means connecting said supporting tube to said sleeve at opposite sides thereof, and locking means at right angles to said opposed hinge means connecting said supporting tube to said sleeve to lock said hinge means in a set angular position such that the force vector generated by rotation of the propeller is in the desired direction relative to the hang-glider.

4,546,939

ENERGY EFFICIENT ECS POWERED BY A VARIABLE VOLTAGE/VARIABLE FREQUENCY POWER SYSTEM

Michael J. Cronin, Sherman Oaks, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Continuation of Ser. No. 382,491, May 27, 1982, Pat. No. 4,462,561. This application Feb. 29, 1984, Ser. No. 584,699
Int. Cl.⁴ B64D *13/02*
U.S. Cl. 244—118.5 **17 Claims**



1. In an aircraft having at least one variable speed aircraft engine and an environmental control system, the improvements comprising:
an induction motor, said motor having an axially aligned drive shaft exiting opposite ends thereof;
a main cabin compressor arranged to be directly driven by said drive shaft on a first end of said motor, said main cabin compressor having an inlet connected to a first outside or ram air inlet and adapted to pressurize the cabin of said aircraft;
a supercharger compressor arranged to be driven by said motor through a clutch on the opposite end of said motor, said supercharger compressor having an inlet coupled to a second outside or ram air inlet and an outlet coupled to said main cabin compressor;
valve means having a first position isolating said supercharging compressor from said main cabin compressor and a

second position coupling said supercharging compressor in series to said main cabin compressor and isolating said first outside or ram air inlet from said main cabin compressor; and

at least one generator driven by said at least one aircraft engine for providing variable voltage/variable frequency power to said motor, said at least one generator being directly driven by said at least one engine.

4,546,940

PROJECTILE, ADAPTED TO BE GIVEN A ROTATION ON FIRING, WHICH MAKES THE PROJECTILE SPIN-STABILIZED

Kurt Andersson, Pudelgrand 10, S-123 62 Farsta; Nils Bartelsson, Furusundsgatan 12, S-115 37 Stockholm, and Stig Bondesson, Olvontunet 10, S-181 48 Lidingo, all of Sweden

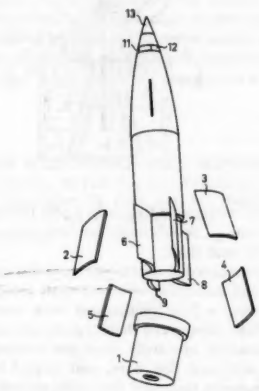
PCT No. PCT/SE80/00228, § 371 Date May 14, 1981, § 102(e) Date May 14, 1981, PCT Pub. No. WO81/00908, PCT Pub. Date Apr. 2, 1981

Continuation of Ser. No. 269,039, May 14, 1981, abandoned. This PCT application Sep. 25, 1980, Ser. No. 570,423

Claims priority, application Sweden, Sep. 27, 1979, 7908002

Int. Cl.⁴ F42B *13/32*

U.S. Cl. 244—3.29 **8 Claims**



1. A guided projectile system for firing a projectile from a barrel and guiding the projectile through its trajectory, said guided projectile system comprising:

rotating means for firing said projectile from said barrel and for rotating said projectile at a spin rate in the range of 300–2000 rad/sec to enable said projectile to be in a stabilized state in its trajectory solely by rotating motion, said projectile travelling at least half of its trajectory outside the barrel in said stabilized state;

said projectile including stabilizing fins located in a retracted position during said stabilized state and being extendable to an extended position at a desired point in the trajectory of said projectile to thereby brake rotation of said projectile;

said projectile having an aerodynamic center of pressure located in front of the center of gravity of said projectile when said stabilizing fins are in said retracted position, and the aerodynamic center of pressure of said projectile being moved, when said stabilizing fins are in said extended position, to be located behind the center of gravity of said projectile for stabilization of said projectile; and

said projectile, upon extension of said stabilizing fins to said extended position for braked rotation of said projectile, changing over from being stabilized solely by rotating motion to being fin-stabilized by said stabilizing fins shifting said aerodynamic center of pressure to be located behind the center of gravity and said projectile.

4,546,941

FOLDABLE SUPPORT STRUCTURE OF CARDBOARD, PLASTIC AND THE LIKE

James R. Hildebrand, 4102 E. 7th St., P.O. Box 4830, Long Beach, Calif. 90804

Filed Mar. 13, 1984, Ser. No. 589,019

Int. Cl.⁴ A45D *19/04*

U.S. Cl. 248—174 **4 Claims**

1. A two-component, interlocked support structure, each component formed from a cut-out blank of cardboard, and the like, each component comprising:

A. a panel array, each array defining two outer panels, two respective adjacent inner panels, and a center panel adjacent to the respective inner panels, the corresponding panels in the array being of equal size;

B. fold lines defined between adjacent panels for folding movement of panels therealong, each inner panel defining a fold line medially thereof;

C. opposed, interlocking means provided along outer edges of the outer panels;

D. interlock slots defined along fold lines of the panels, the slots of each component being reverse opposed to each other;

E. a support cover panel extending from the center panel and joined thereto along a fold line;

F. interlock slots defined from a panel edge and along a fold line between the outer panel and an adjacent inner panel of one of said components; and,

G. a foldable interlock cover panel provided forwardly of the cover panel, the interlock panel defining a plurality of interlock slots; the support structure being formed by the steps of:

(a) folding each component blank to interlock adjacent edges with the interlocking means to form two preliminary, five-sided congruent structures;

(b) interlocking both preliminary structures along their respective reverse opposed slots, thereby forming: i. an internal, cylindrical structure defined by the said interlocked adjacent edges of each interlocked component; and, ii. an external perimeter structure defined by the remaining portion of the panels, the center panels being positioned in opposed relationship on the said perimeter, and respective corresponding inner panels of each array being oriented outwardly in opposed relationship on the perimeter of the structure to form adjacent outwardly folded walls, and thereby produce a ten-sided perimeter;

(c) inserting each of said cover panels along its slots to interlock with the said interlock edge slots and into opposed registry, to form: i. a closed upper cover supported by the internal cylindrical structure and external perimeter structure; and, ii. an open-ended bottom structure; each of said cover panels being outwardly biased, and in frictional contact with each other; thereby producing a static equilibrium therebetween, and forming a flat, stable, upper support for a downward load on the said cover, the support structure being adapted to deform, and distribute load forces there-

through, including twisting movements and oblique forces, the structure being adapted for unlocking and unfolding to form the respective cut-out blanks.

4,546,942

PORTABLE PLATFORM FOR SLIDE PROJECTION

Joseph F. Winchel, 1605 Oakhorne Dr., Harbor City, Calif. 90710

Filed Apr. 9, 1984, Ser. No. 597,846
Int. Cl.⁴ F16M *11/04*
U.S. Cl. 248—187 **1 Claim**

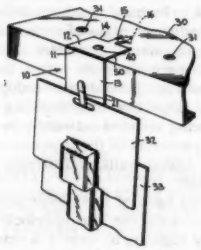
1. A portable platform for slide projection, comprising, in combination, a plate of suitable lightweight material, an opening through a center of said plate, a tripod having an upwardly extending screw fastener affixed upon a top thereof and extending through said opening, a knurled circular nut fastener being removably threadedly engaged with said screw fastener on the side of said plate opposite said tripod, a plurality of three projector-fastening similar openings through said plate being equally and radially spaced from the first said opening, said plate being of "Y"-shaped configuration and including a pair of rearward extensions and a single forward extension, a foot affixed to an underside of each said rearward extension and an adjustable foot under said forward extension including an externally threaded portion threadedly engaged in a threaded opening through said forward extension for adjusting forward tilt of said plate.

4,546,943

STRIP MERCHANDISER

Jacob Fast, 7561 NW. 9th St., Plantation, Fla. 33317

Continuation-in-part of Ser. No. 422,009, Sep. 23, 1982,. This application Apr. 4, 1984, Ser. No. 596,521
Int. Cl.⁴ A47B *96/06*
U.S. Cl. 248—205.3 **16 Claims**



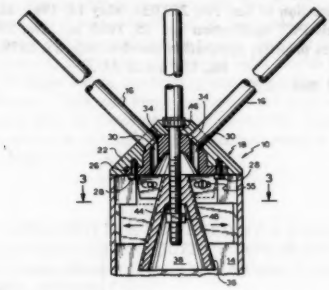
1. An article of manufacture for suspending apertured items forwardly of a display shelf, said article of manufacture comprising an integrally formed elongated plastic strip subdivided into a mounting portion and an item-supporting portion by a transversely-extending fold line extending entirely across the width of the strip to permit said mounting portion to be disposed horizontally on the display shelf and said item-supporting portion to be suspended vertically forwardly of the display shelf, said mounting portion having an upper edge remote from said fold line with an anchor member extending therefrom, said anchor member including a stem portion terminating in a transversely widened anchor portion, and wherein said item-supporting portion includes at least one finger-like member with a proximal end secured to said strip and a remote end which can be projected forwardly of said strip by bending said finger-like member at said proximal end.

4,546,944

POST CAP FOR MOUNTING FIXTURE

Michael S. Cea, Salem, N.H., assignor to Keene Corporation, Union, N.J.

Filed Jan. 16, 1984, Ser. No. 570,917
Int. Cl.⁴ F21V *21/10*
U.S. Cl. 248—219.2 **8 Claims**



1. A cap for mounting a fixture to a post having a longitudinal shaft extending therethrough, said cap comprising:

a closure for said shaft;

a drive cone secured to said closure and disposed below said closure and extending into said shaft interior said drive cone having a first longitudinal bore extending downwardly from the top end thereof and a second longitudinal bore extending upwardly from the bottom end thereof aligned with said first bore, said second bore having a larger diameter than said first bore whereby to define a shoulder;

at least one finger within said shaft mounted to said closure for transverse movement, said finger having an inner edge abutting said drive cone and an outer edge; and,

means for shifting said drive cone upwardly with respect to said closure whereby said drive cone urges said finger outwardly to engage the interior of said post, said means including a drive screw extending through said closure; and a nut positioned within said drive cone second bore and dimensioned to seat against said shoulder.

4,546,945

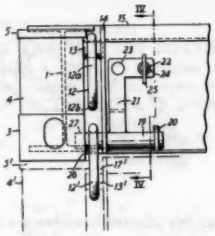
FREIGHT-CARRYING PLATFORMS

Stanley Nessfield, Driffield, England, assignor to Sea Co Services Limited, London, England

Filed Apr. 29, 1982, Ser. No. 373,304
Claims priority, application United Kingdom, Apr. 30, 1981, 8113339
Int. Cl.⁴ A47G *29/00*; B65D *19/38*
U.S. Cl. 248—346 **7 Claims**

1. A platform for carrying freight having a fixed frame with ISO corner units mounted in the frame and a plurality of releasable connection means mounted in the frame and distanced from the ISO corner units for connecting the platform to an adjacent platform in a stack, each releasable connection means comprising a pin and receiving member having an aperture so

that the pin of the platform engages the aperture of a receiving member of an adjacent platform when the platform and the adjacent platform are assembled in a stack, wherein each aperture receiving member is a link movable relative to the frame of the platform and is biassed to a retracted position in which it does not protrude from the top or bottom surface of the platform and is manually movable against the bias into an



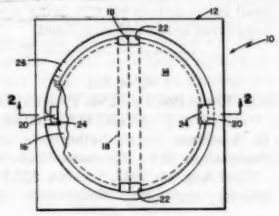
extended position in which a portion of the link projects proud of the platform and a bolt mounted on the platform and being movable within the extremities of the frame to engage the aperture of a corresponding link of an adjacent platform when the corresponding link is in its extended position to enable the platform and the aid adjacent platform to be locked one relative to the other when assembled together in a stack.

4,546,946

COASTER WITH REMOVABLE SUPPORT PLATE

Richard B. Jenison, 48 Hill Top Dr., Cranston, R.I. 02920

Filed Mar. 26, 1984, Ser. No. 593,553
Int. Cl.[4] A47G *23/03*
U.S. Cl. 248—346.1 **4 Claims**



1. A coaster comprising

a base member defining a circular cavity and an upwardly directed opening to said cavity,

said base member having an elongated support extending only along a single axis through the center of said cavity and extending substantially across said cavity, a projection extending into said opening to said cavity at a location higher than said elongated support, and a pair of edge supports on opposite sides of said elongated support at the same height as said elongated support, and

a support plate removably mounted in said cavity so as to support a vessel on its exposed upper surface,

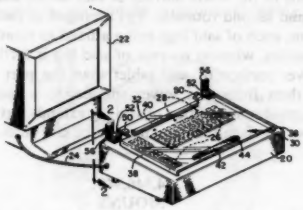
said plate being supported by said elongated support and said edge supports, said plate having a notch adapted to pass by said projection without interference as said plate is moved through said opening, said plate being mounted for rotatable movement when below said projection to move a portion of said plate under said projection so as to interfere with removal of said plate.

4,546,947

KEYBOARD DUST COVER HAVING INTEGRAL COPYHOLDER

Jeffrey Gesten, 6271 Red Cedar Cir., Lake Worth, Fla. 33463

Filed Mar. 15, 1984, Ser. No. 589,897
Int. Cl.[4] B41J *11/02*
U.S. Cl. 248—442.2 **10 Claims**



1. A cover and copyholder for a self-standing keyboard housing connected to and relatively movable in relation to a screen, the keyboard housing includes an array of keys on an upper working surface, comprising:

a planar cover and copyholder body movably mounted to and movable in relation with the keyboard housing, said cover and copyholder body movable between

a first portion in which said cover and copyholder body protectively overlies the upper working surface of the keyboard housing and the array of keys for covering purposes, and

a second position in which said cover and copyholder body projects upward and rearwardly for copyhold purposes,

said cover and copyholder body including at least a portion of a hinge means for pivoting said cover and copyholder body from said first position to said second position or from said second position to said first position,

said hinge means including a generally horizontal pivot axis adjacent a rear edge of the keyboard housing; and,

said cover and copyholder body including a top surface and an underside surface and a receptacle means for supporting paper against said underside surface when said cover and copyholder body is in said second position, said receptacle means positioning the paper immediately adjacent and to the rear of the keyboard housing and

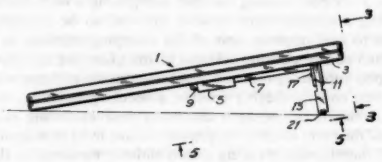
attaching means for said cover and copyholder body removably mountable on the keyboard housing, said attachment means connected to the keyboard housing, said attaching means including the other portion of said hinge means.

4,546,948

EASEL

Daniel A. Ferrara, Bantam, Conn., assignor to Summagraphics Corporation, Fairfield, Conn.

Filed Mar. 21, 1983, Ser. No. 477,301
Int. Cl.[4] A47G *1/24*
U.S. Cl. 248—454 **1 Claim**



1. An adjustable easel to support a tablet having a planar lower surface at an angle to a surface comprising:

a guide rigidly affixed to the lower surface of said tablet;

a rail reciprocally movable in said guide in a plane parallel to the lower surface of said tablet;

a strut affixed to said rail and substantially perpendicular to the plane of the lower surface of said tablet to support said tablet at an angle to the surface, wherein the longitudinal axis of said strut is substantially perpendicular to the longitudinal axis of said rail and substantially parallel to the plane of the lower surface of said tablet; and

first and second rotatable legs arranged at each end of said strut, each of said legs being affixed to rotate from a first position, whereat no part of said leg is further from said lower surface of said tablet than the part of said strut furthest from said lower surface, to a second position whereat some portion of said leg extends further from said lower surface than any portion of said strut.

4,546,949

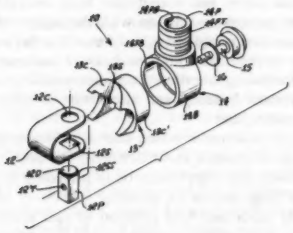
MOUNT

Robert A. Millett, Newport Beach, and James A. Millett, Costa Mesa, both of Calif., assignors to ROI Development Corp., Santa Ana, Calif.

Filed Jan. 9, 1984, Ser. No. 569,505

Int. Cl.⁴ H01Q *1/32*

U.S. Cl. 248—514 **7 Claims**



3. A mount adapted to be secured to a mounting member such as a rail or the like for mounting a device thereto, said mount comprising U-shaped strap means having a configuration corresponding to the configuration of the mounting member to which it is to be mounted for wrapping the strap partially around the mounting member, said strap means being constructed and defined to removably engage a securing post between the ends of the strap means adjacent the open end of said U-shaped strap means, said securing post having a securing aperture arranged intermediate its ends and constructed and defined to be removably mounted to said ends of the strap means with the securing aperture longitudinally aligned with the longitudinal axis of the strap means; a hollow rail clamping member having one end constructed and defined to receive said ends of the strap means and having a configuration corresponding to the configuration of the mounting member to which it is to be mounted on the opposite side of the mounting member from the strap means to secure the mounting member therebetween, the opposite end of the clamping member being constructed and defined with a cylindrical outer configuration; a hollow L-shaped housing member comprising a body member having a stepped bore sized at one end to be rotatably mounted to said opposite end of the clamping member in a preselected rotary position relative to the clamping member, the stepped bore being reduced in diameter at the end opposite to said one end to slidably receive a securing member, the L-shaped mount providing a mounting post extending outwardly of the body member to provide means to have a device attached thereto; and securing means slidably mounted to the body member at said opposite end and defined to longitudinally extend through the body member and said clamping member to be secured to the securing post at the securing aperture for securing the thus defined mount to the mounting member.

4,546,950

SHOCK ABSORBING SUPPORT FOR MICROPHONES

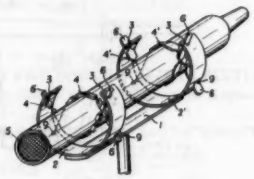
Karl Cech, Mödling, Austria, assignor to AKG Akustische u.-Kino Geräte Gesellschaft, Austria

Filed Jun. 1, 1982, Ser. No. 384,004

Claims priority, application Austria, Jun. 4, 1981, 2503/81

Int. Cl.⁴ H04R *1/02*

U.S. Cl. 248—610 **4 Claims**



1. A band assembly adapted to embrace a microphone, comprising:

a support structure;

a U-shaped open ended fork member mounted on each end of said support structure, each fork member having a pair of ends spaced apart from each other and remote from said support structure with a first slot in each end of each fork member and a second slot spaced away from each end of each fork member and between said first slot and said support structure on each side of each fork member;

a first elastic band connected between the first slots of each fork member;

a second elastic band connected between said second slots of each fork member; and

each elastic band comprising a multiplicity of alternating large and small cross-sectioned portions, one small cross-sectioned portion adjacent each end of each band being engaged into one of said first and second slots, said first and second band adapted to embrace a microphone for elastically supporting a microphone on said fork members, each small cross-section portion being more elastic than each large cross-section of each band.

4,546,951

MOULD FOR ENCAPSULATING PARTS OF ELEMENTS INTO A PLASTIC MATERIAL

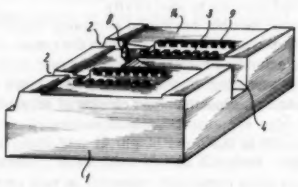
Everardus H. Boschman, Aerdt, Netherlands, assignor to Arbo Gereedschapsmakerij B.V., Zevenaar, Netherlands

Filed Aug. 16, 1983, Ser. No. 523,748

Claims priority, application Netherlands, Aug. 19, 1982, 8203255

Int. Cl.⁴ B29C *6/04*

U.S. Cl. 249—95 **23 Claims**



1. A mould assembly for encapsulating a plurality of electronic components in an encapsulation material, which mould assembly comprises a holder and a plurality of elements made from steel and having accurately finished surfaces such that said plurality of elements fit together within the holder and can be clamped tightly in the holder; wherein each element has a mould cavity for said encapsulating, and sprues for supplying

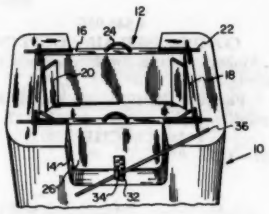
said encapsulation material to said mould cavity; wherein said elements of the mould each have at least on that surface within which the cavity is formed, and including the surface of said cavity, a hardened layer deposited by means of vapour in a vacuum at high temperature; and wherein said elements have a structure and finish such that deformation of each element resulting from the deposition operation is effectively eliminated when said elements are clamped in said holder.

4,546,952

INGOT MOLD WITH HOT TOP BOARD ASSEMBLY

Frederick W. Prines, Latrobe, Pa., assignor to Metallurgical Exoproducts Corporation, McKees Rocks, Pa.

Filed Feb. 1, 1984, Ser. No. 575,894
Int. Cl.[4] B22D *7/10*
U.S. Cl. 249—106 **5 Claims**



1. In a combination of a big end up mold having a pair of slots along opposite sides and extending downward from a top of the mold and a hot top board assembly arranged in box-like relationship and retained along an inner perimeter of a top portion of the mold, those of said boards extending across said slots having a metal plate in the area of and extending across and beyond said slots, the improvement comprising compressible seal means positioned along an outer surface of each of said boards for compressible engagement with the mold below said slots and means associated with said boards for forcibly retaining said boards against the mold interior to compress the seal means, said forcible means including a perforated metal strip extending normal from each of the said boards and through a space formed by each of said slots and a rod for engaging one of said perforations and a mold exterior adjacent each of said slots.

4,546,953

BALL VALVE

Costantino Vinciguerra, Florence, Italy, and Jean Lephilibert, Levallois-Perret, France, assignors to Nuovo Pignone S.p.A., Florence, Italy and Schlumberger Industrie S.A., Montrouge, France

Filed Feb. 27, 1978, Ser. No. 881,593
Claims priority, application Italy, Mar. 10, 1977, 21123
Int. Cl.[4] F16K *31/12*
U.S. Cl. 251—58 **4 Claims**

1. A ball valve for cutting off the flow in a pipe line of a large diameter having a spherical body, a valve seat and a shutter movable to and from said seat, wherein said movement includes rotation of the shutter about the axis of the valve and subsequent radial movement to and from its seat, comprising:

a yoke within said valve body centrally supporting said shutter through a spring mechanism which is rotatable with the shutter,

an annular structure pivoted to and within the valve body by opposing rotatable pins supported by the valve body,

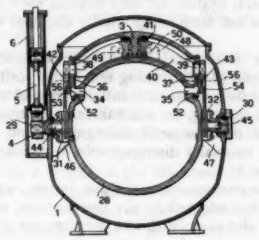
a pair of opposing connecting rods carried by and pivoted eccentrically to said annular structure relative to said rotatable pins wherein each of said rods has a head pivotally connected to an end of said yoke,

a pair of opposing pins having grooves therein which are supported idly by said rotatable pins,

a pair of opposing guide arms each of which has one end inserted in a groove of said grooved pins and the other end thereof coupled to an end of said yoke,

a pair of opposing arresting planes within and supported by the valve body to limit the rotation of said guide arms to 90° in moving the shutter to its seat,

latching means on said annular structure releasably engaged



by said yoke to keep the rotation of said shutter, yoke and guide arms assembly in unison until the shutter is in a confronting relationship to its seat as said guide arms abut said arresting planes, whereupon further rotation of said rotatable pins and said annular structure causes said eccentrically pivoted connecting rods to straighten and advance the shutter against its seat, and

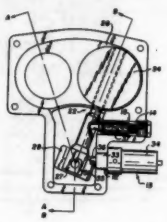
a servomotor connected to one of said rotatable pins for rotation and radial movement of the shutter to and from the seat through rotation of said rotatable pins.

4,546,954

ENGINE AIR CUT-OFF VALVE

Ronald J. Bodnar, 1448 Knottwood Rd. East, Edmonton, Alberta, Canada T6K 2J9

Continuation of Ser. No. 390,292, Jun. 21, 1982, abandoned.
This application Sep. 7, 1984, Ser. No. 648,605
Int. Cl.[4] F16K *25/00*
U.S. Cl. 251—88 **2 Claims**



1. An air cut-off valve comprising:

a flat housing formed by a hollow body, having a main wall and an upstanding side wall extending along the entire perimeter of the main wall, and a flat cover secured thereto and generally parallel to the main wall, said housing defining an internal chamber and having upstream and downstream walls which are opposed and form inlet and outlet ports respectively, said housing having gate and stem ends and being adapted to be connected in an air supply line whereby the ports and chamber form part of the air flow path, said ports being positioned at one side of the chamber at the gate end, whereby the other side of the chamber provides a storage cavity;

a valve assembly comprising a stem having a gate mounted thereon at one end thereof, said gate being located in the

gate end of the chamber, said stem extending into the stem end of the chamber;

a pivot member positioned in the stem end of the chamber and extending transverse to the axis of the stem, the pivot member being journalled in the upstream and downstream walls of the housing;

said stem being pivotally mounted on the pivot member so that the gate is adapted to move about said pivot member along an arc from the stored position in the storage cavity to an operative position in which it blocks one of the ports and seals against the wall forming such port;

said gate and stem being wholly disposed within the chamber;

elongate mechanical lock-out means, associated with the stem end of the housing and being positioned so that its main axis extends substantially parallel to the main plane of the housing, for mechanically locking the stem in the stored position until disengaged, said lock-out means being manually disengageable to release the stem when required;

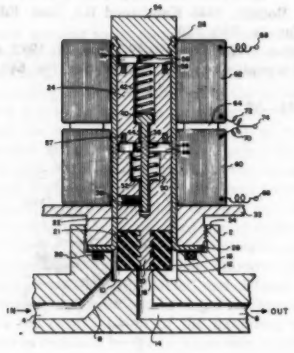
and elongate mechanical drive means, separate from the stem but adapted to act thereagainst, said drive means being also associated with the stem end of the housing and being positioned so that its main axis extends substantially parallel to the main plane of the housing, for normally urging the stem to the operative position, when the lock-out means is disengaged, to shift the gate from the stored position to the operative position.

4,546,955

TWO-STAGE SOLENOID VALVE

Kenneth E. Beyer, West Hartford, and Wilhelm H. Horlacher, Newington, both of Conn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 14, 1982, Ser. No. 434,305
Int. Cl.[4] F16K *31/06*
U.S. Cl. 251—129.15 **8 Claims**



1. A two-stage solenoid valve comprising

orifice means for providing a fluid path,

sealing means for sealing said orifice means,

armature means for urging said sealing means toward said orifice means, said armature means including a first and a second armature, a fixed stop means and a first resilient means for establishing a gap between said stop means and said first and said second armatures, said first and second armatures being coaxial and

solenoid drive means for selectively establishing in response to first and second energizing signals corresponding first and second positions of said armature mean to provide a first and a second spacing, respectively, of said sealing means with respect to said orifice means to effect a corresponding first and a second flow rate through the valve, said drive means including first actuating means for eliminating said gap to establish said first position of said sealing means in response to said first energizing signal, wherein said armature means includes a connecting rod extending between said first and second armatures, means attaching one end of said rod to said second armature and means allowing said first armature to slide on said rod, said rod having a head on a second end thereof bearing against a first end of said first resilient means with a second end of said first resilient means contacting said fixed stop means,

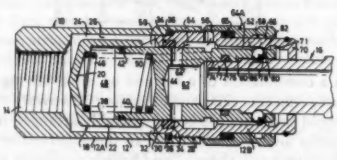
wherein said armature means includes a second resilient means for establishing a gap between said first and said second armatures and said drive means includes second actuating means for eliminating said gap between said armatures in response to said second energizing signals to establish in combination with said first actuating means said second position of said sealing means.

4,546,956

COMPRESSED AIR COUPLING

Kurt E. L. Moberg, Skövde, Sweden, assignor to Karl Ove Nyberg, Skövde, Sweden

Filed Jul. 25, 1983, Ser. No. 517,503
Claims priority, application Sweden, Jul. 27, 1982, 8204473
Int. Cl.[4] C11D *7/00*
U.S. Cl. 251—149.6 **1 Claim**



1. In a compressed air coupling comprising a socket, a valve sleeve displaceable in the socket, said socket having a compressed air inlet means releasably to lock the sleeve in a first position in the socket, a nipple insertable into the sleeve, a ball catch carried by the sleeve releasably to lock the nipple in the sleeve, means defining a first passage for flow of compressed air from said compressed air inlet through the socket and sleeve and into the nipple in said first position of the sleeve, the sleeve being movable relative to the socket to a second position upon release of said locking means, in said second position said ball catch releases the nipple, and resilient means urging the sleeve in a direction from said first position toward said second position; the improvement in which the sleeve with the nipple locked therein is movable to a position intermediate said first and second positions, said sleeve in said intermediate and said second positions cooperating with a first inner surface portion of said socket to block the first passage to prevent flow of compressed air from said compressed air inlet of said nipple, means defining an open passageway from the interior of the nipple to a region outside the coupling in said intermediate position, the socket having on a second inner surface portion, in the direction the resilient means urges the sleeve, a cylindrical surface followed by a radially inwardly extending shoulder followed by a radially outwardly extending first ball groove, the nipple having on an outer surface a second ball groove having an inclined side surface, said cylindrical surface maintaining said ball catch in said second groove in said first position of the sleeve, said inclined surface camming said ball catch partially out of said second groove and against said shoulder in said intermediate position of said sleeve when compressed air in the nipple forces the nipple in said direction, the sleeve urging the ball catch against said shoulder to cam the ball catch into said second groove in said intermediate position in the absence of compressed air in said nipple thereby to permit said resilient means to move said sleeve to said second position after compressed air in said nipple has been exhausted through said

open passageway, and said inclined surface camming said ball catch into said first groove in said second position of the sleeve upon movement of the nipple relative to the sleeve in said direction thereby to permit withdrawal of the nipple from the sleeve.

4,546,957

APPARATUS FOR COMBINED HOT ROLLING AND TREATING STEEL ROD

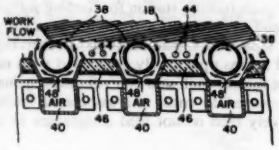
Asjed A. Jalil, Holden; Earl S. Winslow, Jr., Grafton, and Charles H. Gage, Westboro, all of Mass., assignors to Morgan Construction Company, Worcester, Mass.

Continuation of Ser. No. 443,618, Nov. 22, 1982, Pat. No. 4,448,401. This application Dec. 19, 1983, Ser. No. 562,828

The portion of the term of this patent subsequent to May 13, 2001, has been disclaimed.

Int. Cl.[4] C21D *9/52*

U.S. Cl. 266—106 **3 Claims**



1. Apparatus for conveying and treating hot rolled steel rod arranged in a series of offset overlapping rings, comprising: a conveyor having mutually spaced driven rollers on which the rings are transported along a given path; nozzle means defining slots which underlie the rollers and which extend transversely across substantially the full width of said path; heat resistant means filling the gaps between said nozzle means; conduits communicating with said slots; means for supplying cooling air via said conduits, and exclusively through said slots for upward application directly against the undersides of said rollers, whereupon at least portions of the thus applied air flow around said rollers to impinge against the undersides of the rings being transported thereon; and, means associated with said conduits for varying the amount of air being supplied through said slots along the lengths thereof.

4,546,958

LEAF SPRING

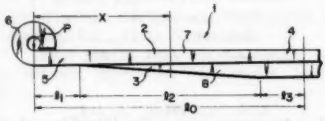
Akira Ohno; Yasushi Itakura, both of Yokohama; Takayuki Tabe, Tokyo, and Shuji Hiromoto, Yokohama, all of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 329,032, Dec. 9, 1981, abandoned. This application May 15, 1984, Ser. No. 610,188

Claims priority, application Japan, Dec. 22, 1980, 55-181524

Int. Cl.[4] F16F *1/18*

U.S. Cl. 267—47 **12 Claims**



1. A leaf spring used in an automotive motor vehicle suspension system, and molded of plastic material reinforced with a large number of embedded fibers running longitudinally therealong, comprising:

a single elongated main body of substantially constant width along the longitudinal direction thereof, said main body having end portions, a central portion and intermediate taper portions of substantial length between said end and central portions, and an elongated rib integrally extending from said main body in a direction perpendicular to the width direction of the main body,

said single main body having a thickness which decreases gradually from the end portions thereof to the central portion thereof along the longitudinal direction thereof, the end portions being thicker than said central portion, and the thickness of at least said intermediate taper portions gradually varying in the longitudinal direction of said main body so that said intermediate taper portions are thicker adjacent said end portions than at said central portions, and

said rib projecting integrally from said main body in the direction of the thickness of said main body and substantially perpendicular to said main body, said rib extending along the longitudinal direction of said main body over at least a major portion of the longitudinal length of said main body,

said rib having a height, in the thickness direction of said main body, which gradually increases from the end portions to the central portion of said main body, and wherein

the total cross sectional area of said main body and said rib and the width of said main body being respectively substantially constant at every position along the longitudinal direction of the leaf spring, whereby the stress at each portion of the intermediate taper portions is substantially uniform along the complete longitudinal length of the intermediate taper portions.

4,546,959

SHOCK ABSORBER HAVING ADJUSTABLE DAMPING MEANS INCLUDING AN AUXILIARY OIL TANK

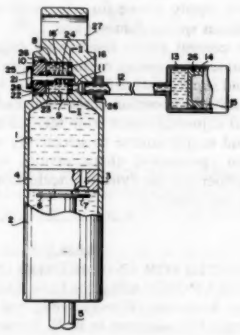
Satoru Tanno, Gyoda, Japan, assignor to Showa Manufacturing' Co., Ltd., Tokyo, Japan

Filed Feb. 13, 1981, Ser. No. 234,443

Claims priority, application Japan, Jul. 10, 1980, 55-96291[U]

Int. Cl.[4] F16F *9/48*

U.S. Cl. 267—64.15 **7 Claims**



1. A hydraulic shock absorber comprising: a cylinder filled with a working oil; a piston slidably fitted in said cylinder and including damping force generating means; a valve chamber formed at one end of said cylinder and having communication means communicating with the inside of said cylinder; a piston rod protruding from the other end of said cylinder to the outside thereof; an oil tank having communication means for communication with said valve chamber by way of an oil port in said valve chamber; a first disc-shaped valve in said valve chamber and formed with a plurality of oil holes which have different effective areas and which have their centers arranged on an identical circle; a valve stem protruding from said first disc-shaped valve to the outside of said cylinder for turning said first disc-shaped valve; whereby said first disc-shaped

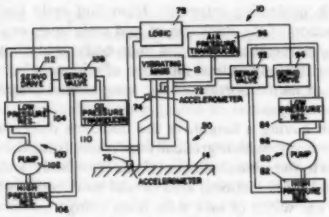
valve can be turned by turning said valve stem to make a select one of said oil holes face the oil port of said valve chamber.

4,546,960

VIBRATION ISOLATION ASSEMBLY

Bernard W. Abrams, South Euclid, and Donald J. Karbo, Shaker Heights, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Filed Jun. 20, 1983, Ser. No. 505,742
Int. Cl.[4] B64C *27/04*
U.S. Cl. 267—136 **8 Claims**



5. An assembly for selectively adaptively controlling vibration, shock, acceleration and position of an item mounted to said assembly independent of varying operating characteristics of the item or a support base for said assembly comprising:

an item to be controlled;

a support platform for supporting said item;

a viscous spring damper mechanically intercoupled between said item and said platform;

first sensing means for sensing vibration, shock, acceleration and position of said item;

second sensing means for sensing vibration, shock, acceleration and position of said support platform;

a gas supply source for selectively supplying gas to said viscous spring damper;

a fluid supply source for selectively supplying fluid to said viscous spring damper; and,

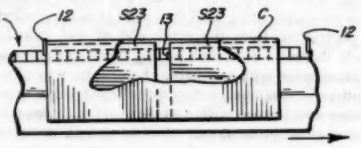
logic control means operatively engaged to said first and said second sensing means, said gas supply source and said fluid supply source for comparing vibration, shock, acceleration and position of said item and said support platform and adjusting inputs from said gas supply source and said fluid supply source to selectively adjust the load/deflection operational characteristics of said viscous spring damper and the dynamic mechanical coupling of said item to said platform.

4,546,961

APPARATUS FOR AND METHOD OF GATHERING 1-UP AND 2-UP SIGNATURES FOR SADDLE STITCHING

Anthony Majewski, Warsaw, Ind., and Theodore W. Mayer, Chicago, Ill., assignors to R. R. Donnelley & Sons Company, Chicago, Ill.

Filed Aug. 20, 1984, Ser. No. 642,079
Int. Cl.[4] B42B *1/02*
U.S. Cl. 270—53 **14 Claims**



1. Apparatus for gathering printed signatures and transporting them to a saddle stitcher, said apparatus comprising, in combination:

a line of several signature feeding stations, one part of the stations in said line being adapted to hold a supply of 1-up signatures and to feed said 1-up signatures seriatim, and another part of the stations in said line being adapted to hold a supply of 2-up signatures each of which has a forward page and a rearward page, and to feed said 2-up signatures seriatim;

a gathering chain running in front of said line of feeding stations, said gathering chain having spaced signature pusher lugs defining receiving areas each of which is long enough for a 2-up signature, and short signature pusher legs alternating with said signature pusher lugs to divide each receiving area into a leading segment and a trailing segment each of which is long enough for a 1-up signature, and the length of said short pusher legs being such that a 2-up signature overlying a leg is not materially distorted;

a supply of signatures at each feeding station;

means at each feeding station for feeding signatures seriatim from said supply into a receiving area on said chain to gather a pack of signatures in each receiving area;

a control means operatively associated with each signature feeding means, each said control means being constructed and arranged to cause the associated feeding means to selectively feed or not feed a signature in response to a signal;

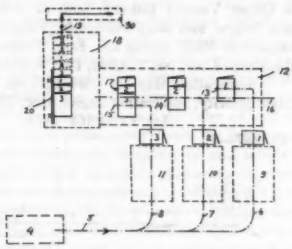
and electronic programming means including first means for signalling at least a selected one of said control means to first feed at least one 1-up signature into at least one of the segments of each receiving area of the gathering chain, and second means for thereafter signalling at least one other selected control means to feed at least one 2-up signature into each receiving area of said gathering chain overlying all the 1-up signatures and the pusher leg in each said receiving area.

4,546,962

METHOD AND APPARATUS FOR COORDINATING STREAMS OF NEWSPAPERS BRANCHED OFF FROM A STREAM OF NEWSPAPERS

Ralf Backman, Ekajö, Sweden, assignor to WAMAC AB, Sweden

Filed Jul. 11, 1984, Ser. No. 631,549
Claims priority, application Sweden, Nov. 12, 1982, 8206468
Int. Cl.[4] B65H *39/02*
U.S. Cl. 270—54 **10 Claims**



1. Method for recombining a plurality of branch newspaper streams which issue from a single stream formed by a printing press into a single recombined stream having a newspaper flow rate which is equal to the flow rate of said single stream, said method comprising the steps of:

directing said branch streams to move along a first direction;

running a receiving conveyor transversely to said first direction;

forming a batch of partially overlapped newspapers at spaced longitudinal batch locations of said receiving con-

veyor, each said batch being formed by successively depositing one newspaper from each said branch stream at each said batch location, the newspapers in each batch being laterally displaced from one another by a given distance;

running a collecting conveyor transversely to said receiving conveyor, said receiving and collecting conveyors having a transfer location through which each said batch is transferred from said receiving conveyor to said collecting conveyor; and

depositing each said newspaper batch on said collecting conveyor, each said batch partially overlapping a previously deposited batch, each said batch being spaced from a previously deposited batch by a distance equal to said given distance.

4,546,963

SHEET SEPARATION APPARATUS

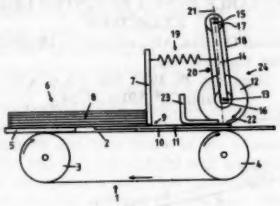
Johannes H. A. Dinnissen, Venlo, Netherlands, assignor to Océ-Nederland B.V., Venlo, Netherlands

Filed Apr. 14, 1982, Ser. No. 368,229

Claims priority, application Netherlands, Apr. 21, 1981, 8101927

Int. Cl.⁴ B65H *3/46, 1/06*

U.S. Cl. 271—35 **9 Claims**



1. An apparatus for separating sheets being advanced along a transport path in at least partially overlapping relation on a conveyor to a relatively non-displaceable sheet supporting portion of the conveyor, comprising: a bodily displaceable friction member biased toward a position for pressing said sheets against said supporting portion of said conveyor by bearing on said sheets along a line of contact located opposite said supporting portion and extending transverse to said transport path and means mounting said friction member for free swinging movement into, and by friction of said sheets from, the location of said line of contact about an axis lying parallel to said line of contact, said axis being so located that a plane extending through said axis and said line of contact intersects said transport path at an angle thereto, viewed in the direction of sheet transport, in the range of between 70° and 90°.

4,546,964

SHEET CONVEYING DEVICE

Theodoor H. Linthout, Grubbenvorst, Netherlands, assignor to Océ-Nederland B.V., Venlo, Netherlands

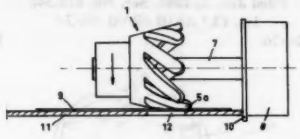
Filed Jan. 24, 1983, Ser. No. 460,268

Claims priority, application Netherlands, Feb. 1, 1982, 8200355

Int. Cl.⁴ B65H *5/06, 9/16*

U.S. Cl. 271—250 **10 Claims**

1. A sheet conveying device comprising means forming a conveying path for sheets, a sheet abutment strip along a side of said path, and a rotatable friction member for advancing a sheet along said path while bringing an edge of the sheet into and/or holding such edge in contact with the abutment strip, said friction member being rotatable about a fixed axis extending transversely over the conveying path and being provided with at least one flexible elongate finger the central longitudinal axis of which extends substantially throughout the length of the finger in a direction that is the resultant of an axial component directed toward said abutment strip and a tangential component in the direction of rotation of said member, each said finger on rotation of said member about said fixed axis traversing a surface of revolution that intersects said path.



4,546,965

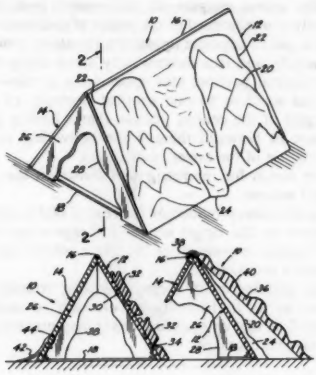
MOUNTAIN CLIMB AND SLIDE

Otela Baxter, and George Spector, both of 233 Broadway Rm 3615, both of New York, N.Y. 10007

Filed Mar. 20, 1984, Ser. No. 591,601

Int. Cl.⁴ A63B *21/00*

U.S. Cl. 272—56.5 R **3 Claims**



1. Apparatus for climbing and sliding which comprises:

(a) a first panel having an irregular surface forming a plurality of hand and toe holds so that a child can climb thereupon;

(b) a second panel having a smooth flat surface so that said child can slide thereupon;

(c) a hinge member connecting inner ends of said first panel and said second panel together; and

(d) at least one brace member interconnecting outer ends of said first panel and said second panel so that said panels may be set up in inclined positions, wherein said irregular surface of said first panel simulates craggy mountains for a hard climb and a valley for an easy climb, further comprising a pair of triangular cave panels, each said cave panel having an opening and connected to side ends of said first panel and said second panel so that said child can crawl therethrough, further comprising:

(e) said first panel having a plurality of horizontal and vertical interconnecting slots; and

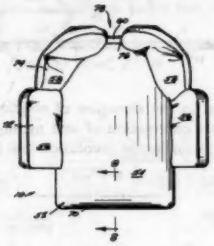
(f) a plurality of hand and toe gripping members, each hand and toe gripping member having pins extending therefrom to slide within said slots so that the pattern of said hand and toe gripping members can be varied so as to vary said irregular surface.

4,546,966

BOXER TRAINING AID

Perfecto B. Segura, 1725 Anita Dr., Las Cruces, N. Mex. 88001

Filed Jun. 7, 1984, Ser. No. 618,348
Int. Cl.[4] A63B *69/00, 69/34*
U.S. Cl. 272—76 **10 Claims**



1. A boxer training aid, comprising:

a strong and stiff frame including a central portion constructed and arranged to frontally cover a wearer's torso at least from about mid-chest height down to about mid-thigh height, a pair of opposite side wing portions which project obliquely forwardly along generally vertical opposite lateral margins of said central portion approximately a middle third of the height of said central portion, and a pair of opposite upper wing portions which project forwardly and face downwardly along upper margins of said central portion; said upper wing portions being arranged so close to one another centrally of the upper margins of the central portion that a boxing gloved fist cannot fit between them while delivering an uppercut during use of the boxer training aid;

support means for mounting said frame on the torso of a target wearer;

hand-grip means provided on the rear of said frame for being gripped by the target wearer for regulating side-to-side and angular movement of the frame relative to the target wearer's torso; and

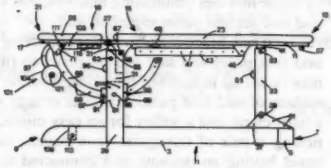
resilient padding body means provided frontally on said frame so as to frontally cover each of said portions thereof, so that an opposing boxer may practice punching the targeted wearer.

4,546,967

EXERCISE BENCH

Ihor G. Kecala, 3508 W. 17th Ave., Vancouver, British Columbia, Canada V6S 1A1

Filed Jan. 25, 1983, Ser. No. 460,934
Int. Cl.[4] A63B *23/00*
U.S. Cl. 272—93 **16 Claims**



1. An exercise bench comprising:

(a) a horizontal ground engaging base having front and rear ends,

(b) a bench having a comparitively long front seat portion and a comparitively short rear seat portion, each seat portion having front and rear ends,

(c) hinge means connecting the rear end of the front seat portion to the front end of the rear seat portion,

(d) first extendable support means rigidly connected to the base and supporting the bench at the hinge means,

(e) second extendible support means pivotally connected adjacent the front end of the base and engaging the front seat portion for adjustably tilting the front seat portion from a horizontal position to an upwardly or downwardly inclined position,

(f) tilting means for adjustably tilting the rear seat portion from a horizontal position to an upwardly or downwardly inclined position,

(g) an elongated arm having a cross member connected at one end, which cross member carries on its free ends one roller each for engaging body extremities during certain exercises, and

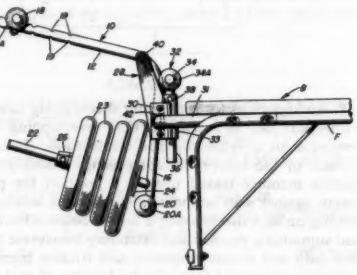
(h) a plurality of means at different locations on the exercise bench for selectively receiving the elongated arm at one of said locations.

4,546,968

ADJUSTABLE BENCH MOUNTED LEG LIFT EXERCISER

Ira J. Silberman, Opelika, Ala., assignor to Diversified Products Corporation, Opelika, Ala.

Filed Sep. 29, 1982, Ser. No. 428,365
Int. Cl.[4] A01B *23/04*
U.S. Cl. 272—117 **8 Claims**



1. A leg exercise device comprising:

a floor-supported bench having a seat adjacent one end thereof;

an L-shaped member having two arms, said L-shaped member being pivoted intermediate its ends to one end of said bench about a horizontal axis higher than said seat with one of said arms above the other;

a lower ankle-engaging member attached to the lower of said arms;

an upper ankle-engaging member attached to the upper of said arms;

force-applying means attached to one of said arms for resisting upward rotation of said arms by a force applied by a user's leg to either of said ankle-engaging members;

a separate knee support; and

mounting means for vertically adjustably securing said knee support to said one end of said bench independently of said L-shaped member to provide adjustable support for a user's knee when seated on said seat and performing leg lifts, so that the user's ankle properly can engage said lower ankle-engaging member and the user's foot can clear the floor.

4,546,969

TRAILER FOR AN ARTICULATED VEHICLE

Frederick G. Wilson, First St., Belfast BT13 2DQ, Northern Ireland

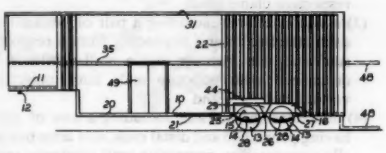
PCT No. PCT/GB83/00015, § 371 Date Sep. 28, 1983, § 102(e) Date Sep. 28, 1983, PCT Pub. No. WO83/02594, PCT Pub. Date Aug. 4, 1983

PCT Filed Jan. 28, 1983, Ser. No. 541,342

Claims priority, application United Kingdom, Jan. 28, 1982, 8202497

Int. Cl.⁴ B62D *33/04*

U.S. Cl. 296—181 **4 Claims**



1. A road trailer comprising:

(a) a pair of transversely spaced wheel arches carrying at least one wheel axle via spring means;

(b) a horizontally disposed base frame attached to said wheel arches substantially adjacent to the level of said axle so that said base frame is below the level of the tops of wheels attached to each end of said axle;

(c) a floor supported by said base frame; and

(d) corrugated upright wall members supported by said base frame for supporting a roof frame, the weight of the load carried by said trailer being transmitted through said spring means to said base frame in the vicinity of said wheel arches and into said upright wall members;

(e) said floor comprising a major portion formed of corrugated sheet material attached to said base frame and a minor portion disposed between said wheel arches and above said wheel axle and being formed of flat steel plate having an upper surface which is level with the upper surface of said major portion and an underside disposed substantially higher than an underside of said major portion and only a short distance above said wheel axle to allow for vertical movement of said wheel axle, thereby to provide a low-lying floor unobstructed along its length apart from each wheel arch.

4,546,970

WEIGHT TYPE EXERCISING DEVICE

Parker E. Mahnke, Studio City, Calif., assignor to Marcy Gymnasium Equipment Co., Alhambra, Calif.

Filed Dec. 6, 1982, Ser. No. 447,239

Int. Cl.⁴ A63B *21/06*

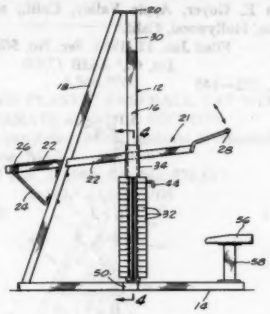
U.S. Cl. 272—118 **3 Claims**

1. An exercising apparatus, comprising:

(a) a triangularly shaped main frame including a base member adapted to engage a supporting surface, a generally vertically extending guide means connected to said base member and an angularly extending member interconnecting said base member and said guide means; said base member and said angularly extending member being disposed in a coplanar relationship;

(b) body engaging means carried by said main frame for movement with respect thereto for engagement by the user during the performance of exercises, said body engaging means comprising a pair of spaced apart lever arms disposed on opposite sides of the plane of said base member and said angularly extending member, said lever arms being pivotally connected to said angularly extending member and having proximate one end thereof engagement means for engagement by the trainee; and

(c) resistance means movable relative to said guide means and operably associated with said body engaging means for yieldably resisting movement thereof in a first direction, said resistance means being operably coupled with



said lever arms intermediate their ends by coupling means, whereby said resistance means will yieldably resist movement of said engagement means in a first direction.

4,546,971

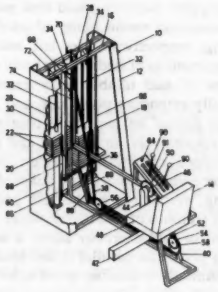
EXERCISE DEVICE

Paul Rassoch, Rte. 2, Box 124A, Fort Atkinson, Wis. 53538

Filed Sep. 5, 1984, Ser. No. 647,712

Int. Cl.⁴ A63B *21/06*

U.S. Cl. 272—118 **9 Claims**



1. An exercise device for the exercise of a user's muscles by movement through an exercise stroke comprising:

(a) a weight tower frame and concentric and eccentric weight stacks supported thereby, each of the weight stacks having a selected number of weights stacked in a generally vertical array, the weights being movable between lowered and elevated positions;

(b) means for selecting weights of the concentric weight stack for movement by the user;

(c) force responsive means for responding to force applied by the exercise of the user's muscles by the lifting of the selected weights of the concentric weight stack from the lowered to the elevated position;

(d) weight adding means for lifting from the lowered to the elevated position a selected number of the weights of the eccentric weight stack without additional exertion of the user; and

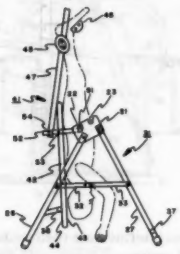
(e) tripping means activatable by the force responsive means at a selected point in the exercise stroke for causing the weight adding means automatically to add the weight of the weights so lifted by the weight adding means to that of the weights of the concentric weight stack lifted by the force applied by exercise of the user's muscles.

4,546,972

TWO-POSITION PIVOT SUPPORT STRUCTURE FOR A TILTABLE BODY EXERCISER

Norman E. Goyer, Apple Valley, Calif., assignor to Leslie Kovats, Hollywood, Calif.

Filed Jan. 11, 1984, Ser. No. 568,931
Int. Cl.[4] A63B *17/00*
U.S. Cl. 272—145 **5 Claims**



1. A support structure for pivotally supporting a tiltable body exerciser about a first or a second horizontally extending pivot axis, said tiltable body exerciser having centrally located, left and right, oppositely extending trunions, comprising in combination:

(a) left and right spaced-apart trunion support members;

(b) a first pair of left and right trunion receiving means located, respectively, in said left and right spaced-apart trunion support members, said first pair of left and right trunion receiving means being adapted for receiving and supporting, respectively, the left and right, oppositely extending trunions of said tiltable body exerciser for tilting movement of said tiltable body exerciser about a first horizontally extending pivot axis; and

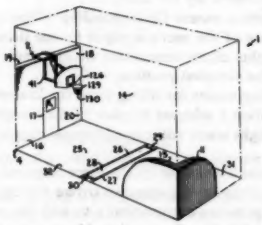
(c) a second pair of left and right trunion receiving means located, respectively, in said left and right, spaced-apart trunion support members, said second pair of left and right trunion receiving means being adapted for receiving and supporting, respectively, the left and right oppositely extending trunions of said tiltable body exerciser for tilting movement of said exerciser about a second horizontally extending pivot axis parallel to and spaced apart from said first horizontally extending pivot axis.

4,546,973

BASKETBALL APPARATUS

Donald D. Mouser, Plainview, Tex., assignor to Horizon Sports, Inc., Lockney, Tex.

Filed Oct. 3, 1983, Ser. No. 539,009
Int. Cl.[4] A63B *63/08, 71/04*
U.S. Cl. 273—1.5 R **18 Claims**



16. A basketball apparatus, which comprises:

(a) a court including:

(1) a back wall with a parapet, an upper edge, an inner face and an outer face;

(2) a pair of opposite side walls;

(3) a front wall; and

(4) a floor;

(b) a support structure including:

(1) a top subframe including front and back crosspieces and a pair of opposite side members;

(2) a clamp subframe including a pair of clamp posts depending downwardly from respective said top subframe side members, a clamp crosspiece interconnecting said clamp posts and a pair of diagonal braces each interconnecting a respective top subframe side member and a respective clamp post;

(3) a wall subframe including a pair of vertical columns each attached to and depending from a respective top subframe side member and a wall subframe bottom crosspiece with opposite ends interconnecting said vertical columns; and

(4) an extension subframe including a pair of arms each having proximate and distal ends, said arms being pivotally connected to respective wall subframe crosspiece opposite ends at said proximate ends thereof, an extension cross member interconnecting said arm distal ends, a pair of extension posts with upper and lower ends, an extension crossbar interconnecting said extension post lower ends and a pair of extension braces each interconnecting a respective arm and a respective extension post;

(c) a basketball goal including:

(1) a backboard with front and back faces;

(2) a hoop attached to said backboard front face and extending therefrom; and

(3) a goal mounting assembly attached to said backboard back face and including a pair of uprights interconnected by upper and lower crosspieces and a pair of sleeves each attached to a respective upright and adapted for slidably receiving said post upper ends;

(d) a tension member attached to said extension subframe and adapted for supporting said extension subframe with said arms in a horizontal position and said basketball goal in a play position spaced outwardly from said court back wall;

(e) a clamp mechanism including:

(1) a pair of clamp nuts each attached to a respective clamp post;

(2) a pair of threaded rods each threadedably received in a respective clamp nut; and

(3) a clamp plate attached to said threaded rods and adapted for engaging said back wall outer face; and

(f) a hoisting mechanism including:

(1) a flexible cable attached to one of said extension subframe and said goal; and

(2) a winch connected to said flexible cable;

(3) said hoisting mechanism being adapted for raising said extension subframe and said basketball goal from said play positions to storage positions with said arms positioned in proximity to said back wall and said back board positioned horizontally and above said back wall upper edge.

4,546,974

FOOTBALL HOLDING DEVICE

Brian M. Brown, 10117 Ivy Gate Cir., Dallas, Dallas County, Tex. 75238

Filed Sep. 2, 1983, Ser. No. 528,977
Int. Cl.[4] A63B *67/00*
U.S. Cl. 273—55 B **9 Claims**

1. A device for holding a football in a substantially upright position comprising:

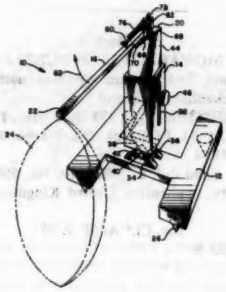
a base portion for engaging the ground;

a support structure extending upwardly from the base portion;

a holding arm having a first end attached to an upper portion

of the support structure in a manner that allows the holding arm to pivot in a vertical and horizontal plane, and a second end adapted for engaging the tip of a football, said football being thereby positioned properly for place kicking;

positioning means for releasably retaining the holding arm in a first position in which a football is engaged from above by the second end of the holding arm; and



retracting means for urging the second end of the holding arm up from the first position after the holding arm is released from the positioning means, whereby the second end of the holding arm swings away and up from the first position when the football is kicked, so as not to interfere with the flight of the ball.

4,546,975

METHOD OF INCREASING BASKETBALL SHOOTING ACCURACY AND AWARENESS

Dean L. Nims, 680-59th St., Des Moines, Iowa 50312

Division of Ser. No. 90,680, Nov. 2, 1979, Pat. No. 4,345,759. This application Mar. 9, 1982, Ser. No. 356,485

Int. Cl.⁴ A63B *41/00*

U.S. Cl. 273—65 R **1 Claim**

1. A method of shooting a basketball to a basket for increasing ball awareness and shooting accuracy by noting the number of ball revolutions, the basketball being multi-paneled with all panels extending substantially 180° around the periphery of the ball and all panels but one being of the same color and said one panel being of a different single color throughout its extent contrasting in color to said same color, said method comprising,

orienting the basketball in the shooter's hands with said one panel of contrasting color to that of the other panels facing the shooter, said one panel extending substantially 180° around the periphery of the ball and having a substantial dimension parallel to the axis of intended ball rotation and being only on one side of the basketball and occupying a small area of the total basketball peripheral area to provide substantial contrast with the remainder of the ball for easy focusing on said one panel as the ball rotates when being shot,

focusing the shooter's eyes on said one panel, and

shooting the ball to the basket while maintaining the eyes on said one panel continuously until the ball reaches the basket and noting the number of ball revolutions during the ball's travel to the basket.

4,546,976

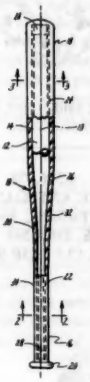
REINFORCED PLASTIC BASEBALL BAT WITH SEPARATE HANDLE SECTION

Thomas N. Jones, Ann Arbor, Mich., assignor to Renosol Corporation, Ann Arbor, Mich.

Filed Feb. 3, 1984, Ser. No. 576,687

Int. Cl.⁴ A63B *59/06*

U.S. Cl. 273—72 R **4 Claims**



1. A baseball bat comprising a hollow metal core extending substantially the length of the bat and a plastic body enveloping said core and having the shape of a conventional baseball bat so that it has a handle section which is of a length to accomodate the hands of a batter gripping the bat and a hitting section which is of a larger diameter and is intended for striking a ball, said hitting section being separate from said handle section, said hitting section and said handle section being separately formed of materials having different characteristics, said handle section being formed of a soft foam material that will dampen vibrations in the bat when a bat is hit, and said hitting section being formed of a dense hard structural foam material.

4,546,977

RACQUET STRINGING MACHINE WITH IMPROVED RACQUET RETAINING STANDARD

Warren M. Bosworth, Jr., Glastonbury, Conn., and Fred E. Martin, San Diego, Calif., assignors to Ektelon, San Diego, Calif.

Filed Jun. 14, 1984, Ser. No. 620,520

Int. Cl.⁴ A63B *51/14*

U.S. Cl. 273—73 A **5 Claims**

1. In the combination of a racket stringing machine and a retaining standard, the improvement comprising:

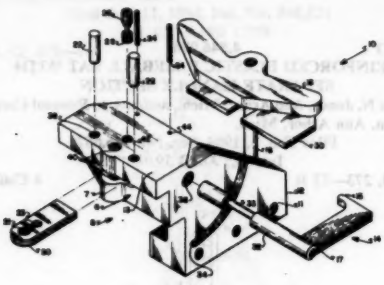
a retaining standard for securing a racquet to be strung in a fixed position, said retaining standard comprising:

a vise having a slot and a plurality of apertures;

a clamp for holding a racquet in position, said clamp having a clamp rod extending from said clamp and into one of the apertures in said vise;

a dog located in said slot for holding and securing said clamp rod in a fixed position;

a handle lever attached to a camshaft, said camshaft being located in one of said apertures in said vise;
a frame retainer between said vise and said clamp; and



means for maintaining said frame retainer in desired alignment with respect to said vise.

4,546,978

DICE AND GAMES

Constant V. David, 4952 Field St., San Diego, Calif. 92110

Filed Jun. 28, 1984, Ser. No. 625,739
Int. Cl.⁴ A63F *9/04*
U.S. Cl. 273—146 **12 Claims**

1. A die comprising:
a geometric body having a plurality of flat external faces and an internal cavity;
indicia on the faces;
a weight inside of the cavity; and
means visible externally of the body for indexing the location of the weight inside the cavity to thereby vary the center of gravity of the die.

3. A die comprising:
a hollow geometric body having a plurality of flat faces;
indicia on the faces;
a ballast weight normally freely movable inside the body; and
means for constraining the movement of the ballast weight inside the body so that when the die is thrown on a flat surface the probability of the die coming to rest with a given one of the faces in an indicating position will vary from throw to throw, including a quantity of fluid inside the geometric body having a viscosity which is substantially constant during variations in the temperature between about 15 degrees C. and 40 degrees C.

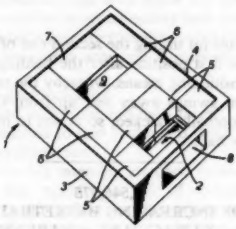
10. A die comprising:
a hollow geometric body having a plurality of flat faces;
indicia on the faces;
a ballast weight normally freely movable inside the body; and
means for constraining the movement of the ballast weight inside the body so that when the die is thrown on a flat surface the probability of the die coming to rest with a given one of the faces in an indicating position will vary from throw to throw, including a quantity of a viscous fluid within the geometric body and a quantity of high density particles dispersed in the fluid.

4,546,979

MOVABLE PIECE PUZZLE

Michael W. Knott, Twickenham, England, assignor to Kelrack Limited, Twickenham, England

PCT No. PCT/GB83/00169, § 371 Date Mar. 12, 1984, § 102(e) Date Mar. 12, 1984, PCT Pub. No. WO84/00308, PCT Pub. Date Feb. 2, 1984
PCT Filed Jul. 8, 1983, Ser. No. 598,341
Claims priority, application United Kingdom, Jul. 16, 1982, 8220678
Int. Cl.⁴ A63F *9/08*
U.S. Cl. 273—153 S **5 Claims**



1. A puzzle comprising a holder, at least one member retained within said holder for movement by hand solely in one plane within an area defined by said holder, a home position in said holder for selectively receiving said member upon movement thereof in said one plane, means in said holder for physically restricting freedom of movement of said member and requiring a sequence of movements to move said member to said home position when said member is within said holder and remote from said home position, said movable member being a container for material, said member having a materials exit mouth, said holder including means permitting discharge of material through said exit mouth solely when said container is in said home position.

4,546,980

PROCESS FOR MAKING A SOLID GOLF BALL

Paul M. Gendreau, Swansea; Francisco M. Llort, Dighton, both of Mass., and Raymond A. Berard, Portsmouth, R.I., assignors to Acushnet Company, New Bedford, Mass.

Filed Sep. 4, 1984, Ser. No. 646,853
Int. Cl.⁴ A63B *37/00*
U.S. Cl. 273—218 **22 Claims**

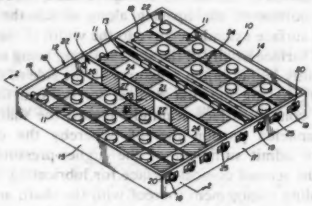
1. In the method of making a golf ball product from an admixture of polybutadiene and a metal salt of an unsaturated carboxylic acid the improvement comprising the use of at least two free radical initiators, one said free radical initiator having a half life at 320° F. which is longer than the half life at 320° F. of the other said free radical initiator, the two free radical initiators being present in the ratio of about 1:9 to about 9:1, the two free radical initiators being sufficiently different in half life to yield a golf ball product having an initial velocity at least 0.5 foot per second higher than the initial velocity of the same golf ball product made with either one of said initiators alone.

8. The method of claim 1 wherein the golf ball product is the core of a two piece golf ball.

4,546,981
CHECKER OR CHESS GAME BOARD WITH ROTATABLE STRIPS

Roberto S. Elizondo, 207 Red Oak, Texas City, Tex. 77590

Filed Jan. 16, 1984, Ser. No. 570,819
Int. Cl.[4] A63F 3/02
U.S. Cl. 273—260 22 Claims



1. A chess- or checker-like board game comprising

a game board of thin sheet material having an array of rows and columns of bilaterally colored squares on opposite surfaces thereof,

said game board being divided into a plurality of separate strips of said sheet material,

each of said strips comprising a complete row or column of said board and spaced adjacent to each other to form the pattern of a chess- or checkerboard,

each of said strips being divided into a plurality of alternating squares, bilaterally colored and having the same pattern on top and bottom sides so that rotation of said strips does not change the pattern of the board,

means supporting each of said strips for rotation between a first position with one surface exposed upward and a second position with the other surface exposed upward, and

means for securing each strip in said first or said second position,

said game board being adapted for play with a plurality of playing pieces selectively movable on said board and releasably held on said strips during rotation thereof.

4,546,982
GOLF CARD GAME

Mary L. Gaines, and Charles J. Gaines, both of Lawton, Okla., assignors to Mary L. Gaines, Corp., Lawton, Okla.

Filed Apr. 2, 1984, Ser. No. 595,705
Int. Cl.[4] A63F 1/00
U.S. Cl. 273—298 3 Claims

1. A method of playing a simulated game of golf using a deck of fifty two cards, each of which has a front and a back and a numeral from 0 to 10 on the front thereof, the method comprising the steps of:

dealing two cards front up and two cards front down to each player;

placing the remaining cards in a stack back side up on a horizontal surface;

turning one card from the remaining cards front side up exposing the numeral thereon and placing said one card adjacent to said stack in a discard stack;

drawing one card from one said stacks by one of said players;

selectively placing one of said drawn cards front down in place of a selected one of said dealt front down cards;

mandatorily discarding the selected front down card onto said discard stack regardless of the values of the numerals on the cards;

discarding one card onto said discard stack by said player;

repeating said drawing and discarding steps by each player in turn;

declaring by one player, "I am putting";

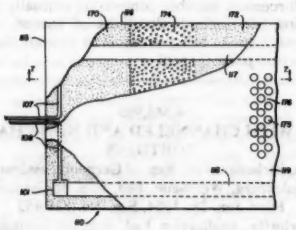
repeating said drawing and discarding steps by the remaining players for one additional turn; and,

totaling the numerals on each player's four cards and comparing the totals wherein the player having lowest total is the winner of one simulated hole and if that player is the declarer he receives the total score of zero for the simulated hole.

4,546,983
MULTI-SPECTRAL TARGET

Stephen P. Rosa, Bethesda, Md., assignor to TVI Energy Corporation, Beltsville, Md.

Continuation-in-part of Ser. No. 302,878, Sep. 18, 1981, Pat. No. 4,422,646. This application Nov. 28, 1983, Ser. No. 555,800
The portion of the term of this patent subsequent to Dec. 27, 2000, has been disclaimed.
Int. Cl.[4] F41J 9/13
U.S. Cl. 273—348.1 13 Claims



8. A target simulating a military asset comprising

(A) a support frame;

(B) an electrical power source having two poles;

(C) a substrate having front and rear sides, supported by said support frame, said front side having a visual representation of the military asset thereon; and

(D) a plurality of modules each of which is capable of emitting infrared signals when an electric current is passed therethrough and is supported adjacent another on said rear side of said substrate in correspondence with said visual representation.

4,546,984
TARGET FOR PROJECTILES

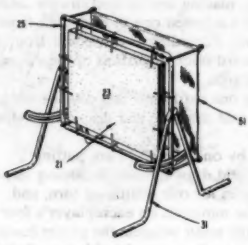
Alan L. Towle, and Milton A. Towle, both of Wausau, Wis., assignors to Sure Stop Manufacturing, Inc., Wausau, Wis.

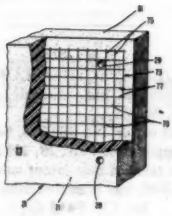
Filed Jan. 27, 1983, Ser. No. 461,545
Int. Cl.[4] F41J 3/00
U.S. Cl. 273—404 13 Claims

1. An archery target comprising: first and second penetrable foam blocks, said blocks having a density and a combined thickness sufficient to retain a pointed projectile both in the location and at the angular orientation at which the projectile passes through the blocks;

a reinforcement member for adding stability to the first and second blocks;

said first and second blocks being secured together along faces thereof with the reinforcement member secured therebetween, the reinforcement member covering substantially the entire surface area of the faces; and





said reinforcement member comprising mutually perpendicular first and second pluralities of spaced, strand-like cords, said cords being secured to one another at each intersection point thereof.

4,546,985

LIP SEAL WITH CHANNELED AND NON-CHANNELED PORTIONS

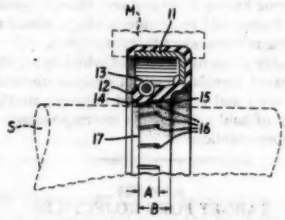
Hans Forch, Birkenau, Fed. Rep. of Germany, assignor to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Jun. 28, 1984, Ser. No. 625,453

Claims priority, application Fed. Rep. of Germany, Jul. 1, 1983, 3323741

Int. Cl.⁴ F16J *15/32*

U.S. Cl. 277—134 **20 Claims**



1. A shaft seal ring for forming a liquid seal between an annular machine element and a shaft co-axially rotatable therein, the shaft seal ring comprising:

a support ring for mounting the shaft seal ring on the machine element fixedly and liquid tight;

a resilient lip ring projecting from an end fixed to the support ring for engaging the shaft;

first and second conical surfaces on the lip ring converging toward each other with the axis of each thereof substantially co-axial with the shaft seal ring and intersecting each other for defining an innermost sealing edge on the lip ring, the second conical surface extending along a portion of the lip ring between the sealing edge and the end of the lip ring fixed to the support ring;

channels spaced about the second conical surface having lateral sides extending generally parallel to the axis of the shaft seal ring from the sealing edge only to a non-channeled portion of the second conical surface, the resilience of the portion of the lip ring along which the second conical surface extends relative to the width of the second conical surface axially of the shaft seal ring being such that sufficiently higher liquid pressures on the side of the shaft seal ring having the first conical surface can force the second conical surface sealingly against the shaft to the non-channeled portion thereof, whereby the channels serve to admit sufficient of the higher-pressure liquid along the second conical surface for lubricating the sliding, sealing engagement thereof with the shaft; and

means for urging the sealing edge into slidable engagement with the shaft sufficiently for sealing the sealing edge and channels about the shaft at lower liquid pressures on the side of the shaft seal ring having a the first conical surface.

4,546,986

GASKET FOR JOINING PANELS WITH A LEVEL SURFACE

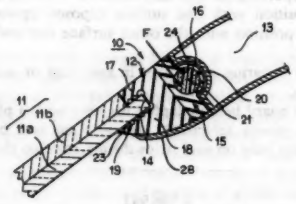
Sergio Roselli, Via 24 Maggio 120, Pise, Italy

Filed Mar. 7, 1984, Ser. No. 586,983

Claims priority, application France, Mar. 9, 1983, 83 03819

Int. Cl.⁴ F16J *15/12, 15/14;* **B60J** *1/00*

U.S. Cl. 277—184 **18 Claims**



1. A gasket for mounting a laminated panel, which panel has dimensions such that the periphery of an inner ply extends beyond the periphery of an outer ply to form a stepped edge, to a second panel and for sealing a joint therebetween, said gasket comprising a U-shaped channel member for receiving and clamping the edges of the inner ply of said laminated panel in a channel wherein an outer side of the channel has a depth equal to the distance that the inner ply of said laminated panel extends beyond the outer ply and a thickness such that an outer surface of said side is level with an outer surface of said outer ply and means for securing said channel member to said second panel, an outer surface of said securing means being level with said outer surface of the outer side of the channel and with an outer surface of said second panel.

4,546,987

PACKING SEAL FOR CAST IRON PIPE JOINTS

Claude Bucher, and Andre Lagabe, both of Pont-A-Mousson, France, assignors to Pont-a-Mousson S.A., Nancy, France

Filed Oct. 29, 1984, Ser. No. 665,858

Claims priority, application France, Oct. 28, 1983, 83 17444

Int. Cl.⁴ F16J *15/32;* **F16L** *17/00*

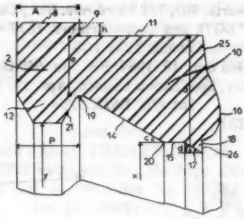
U.S. Cl. 277—207 A **7 Claims**

1. An annular fluid-tight elastomer packing (2) for a joint between a male end (1) and a female end bell housing (3) of

chill-molded centrifugally cast iron pipes, said packing comprising:

(a) a body portion (10) adapted to be radially compressed and axially extended during the insertion of the male pipe end into the bell housing, a radial cross-section of the body portion defining a generally trapezoidal profile having inner long and outer short bases, a radially outer side (11; 23) for engagement against a cylindrical surface (7) of the housing, and an inwardly sloping radially inner side (14) for complementary deformation by and sealing engagement with the outer surface of the inserted male pipe end, and

(b) an anchoring and barrier portion integral with the body portion at the outer short base thereof and defining in radial cross-section an anchor ridge (8) extending radially outwardly beyond the outer side of the body portion for



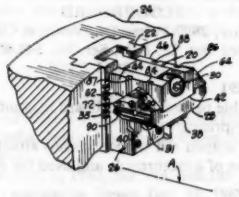
engagement in a matingly configured groove (5) in the housing, and a radially inwardly extending isosceles trapezoid shaped compression foot (12) radially opposite the anchor ridge and connected to the sloping side of the body portion by an annular groove (19; 22), whereby the initial insertion of the male pipe end radially compresses the anchoring and barrier portion to firmly seat the anchor ridge in its housing groove and thereby fix the packing in its intended position in the housing with axially squeezed material being accommodated in the annular groove, and the continued male end insertion progressively radially compresses and axially extends the body portion via engagement with the sloping side thereof to establish a fluid-tight seal, the anchoring and barrier portion thereafter serving to isolate the body portion from the external environment.

4,546,988

CHUCK TOP JAW WITH REMOVABLE INSERT

Edward D. Galley, Mentor, Ohio, assignor to The S-P Manufacturing Corporation, Cleveland, Ohio

Filed Aug. 5, 1983, Ser. No. 520,552
Int. Cl.⁴ B23B *31/16*
U.S. Cl. 279—123 **11 Claims**



1. A top jaw for attachment to a master jaw slidable radially in a front face of a rotary chuck toward and away from a central rotational axis of the chuck comprising:

a base having a radial locating face, a second locating face directed centrally of a chuck, and a first side with a third locating face perpendicular to the radial locating face,

an insert having a radial locating surface, a second locating surface for facing away from the chuck axis and cooperating with said base second locating face, and a second side having a third locating surface extending perpendicular to the radial locating surface,

said base having a radially extending abutment surface along said first side facing axially of the chuck in an opposite direction from the radial locating face and the insert having at least one projection from said second side cooperable with the abutment surface,

said projection being positioned adjacent said abutment surface in a location that prevents movement of the insert relative to the base in a direction axially away from the radial locating face of the base when the said second locating surface of the insert is adjacent the said second locating face of the base, and

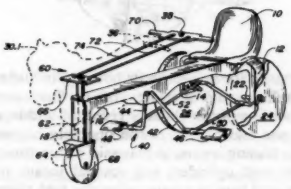
means connecting the insert to the base.

4,546,989

TOY ANIMAL VEHICLE

Arthur G. Peterson, 7818 Eden Ct., Eden Prairie, Minn. 55344

Filed Mar. 26, 1984, Ser. No. 593,508
Int. Cl.⁴ A63F *19/00*
U.S. Cl. 280—1.16 **7 Claims**



7. A toy animal vehicle for riding by a child, comprising a mainframe structure having a seat and a forward tongue member, a pair of rear wheels supporting the seat, a substantially hollow contoured animal body of organic plastics material embracing at least the forward part of the tongue member and having a transverse slot through its upper wall and an upwardly directed knob projecting from its upper wall, and means for steering the vehicle comprising a steerable post in the forward end of the tongue member, with a steerable front wheel below the tongue member and a lateral crossbar member on the post above the tongue member, a steering control member on the knob of the animal body, and connecting means extending from the crossbar member through the transverse slot to the steering control member.

4,546,990

HYDRAULIC DRIVE SYSTEM FOR BICYCLES AND THE LIKE

George A. Harriger, 1217 E. 7th Ave., Houghton, Mich. 49931

Filed Sep. 6, 1983, Ser. No. 529,590
Int. Cl.⁴ B62M *19/00*
U.S. Cl. 280—216 **10 Claims**

9. In a bicycle having a frame for supporting at least one drive wheel, pedals mounted on a drive crank for applying power to propel the bicycle, said crank rotatably mounted within a crank housing carried on said frame, the improvement comprising:

a hydraulic motor means operably connected to rotatably drive said drive wheel, said motor means having fluid inlet and outlet ports;

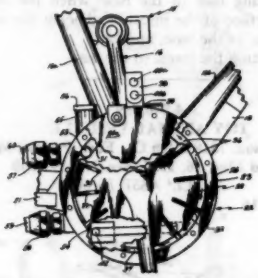
a hydraulic pump having inlet and outlet ports, and fluid conduit means coupling the pump outlet port to the motor inlet port and coupling the pump inlet port to the motor outlet port;

said pump including a housing having a generally cylindrical cavity in fluid communication with said pump inlet and

outlet ports, a rotatable impeller eccentrically disposed within said cavity and operably connected with said crank for rotation thereby as said crank is turned;

said motor including a housing providing said inlet and outlet ports and having a generally cylindrical cavity therein in fluid communication with said ports, said motor having a generally cylindrical impeller eccentrically disposed within said cavity, and means for physically connecting said impeller with said drive wheels for rotation of said drive wheels as said impeller is turned; and

means for adjusting the eccentricity of at least one of said



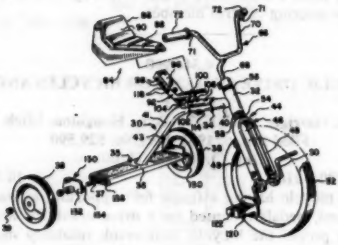
impellers with respect to its housing, including a cylinder attached to said housing and in fluid communication therewith; a piston slidably received within said cylinder with one end of said piston operably connected to said frame; biasing means to bias said piston toward one position in said cylinder; and manual means to selectively adjust said biasing means, whereby said piston and cylinder will move said housing with respect to said impeller against the force of said biasing means when the fluid pressure in said housing changes and the particular pressure at which said piston will respond to move said housing may be selectively changed by said manual means.

4,546,991

ADJUSTABLE SEAT FOR A TRICYCLE

David A. Allen, and Robert L. Diekman, both of Centerville, Ohio, assignors to Huffy Corporation, Miamisburg, Ohio

Filed Apr. 25, 1984, Ser. No. 603,870
Int. Cl.⁴ B62K *9/02*
U.S. Cl. 280—282 **8 Claims**



1. For use with a tricycle of the type having front and rear wheel means, and a main tube extending therebetween, an adjustable seat comprising:

a seat body having a substantially flat seating surface;

seat bracket means attached to said seat body and including a leg portion inclined upwardly relative to said seating surface;

mounting bracket means having a front member shaped to matingly engage a main tube of a tricycle, and a rear member inclined relative to said front member and shaped to matingly engage said leg portion, said rear member inclined such that said seating surface is substantially horizontal when said front member is mounted on a main tube;

means for adjustably mounting said front member on a main tube such that said mounting bracket and said seat body may be selectively attached in a forward or rearward position thereon; and

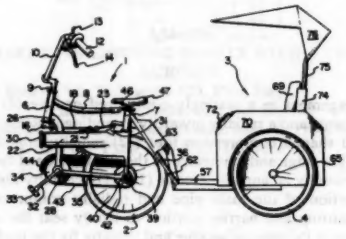
means for adjustably attaching said leg portion to said rear member such that the elevation of said seat body may be selectively varied relative to a main tube and said seating surface is maintained substantially horizontal at all elevations.

4,546,992

SPORTCYCLE

Harold S. R. Swartz, 907, 738 Third Ave. SW., Calgary, Alberta, Canada (T2P 0G7), and Trudy Arthurs, 1630 - 20 Ave. NW., Calgary, Alberta, Canada T2M 1G8

Filed Sep. 10, 1984, Ser. No. 649,068
Claims priority, application Canada, Apr. 19, 1984, 452548
Int. Cl.⁴ B62K *5/04*
U.S. Cl. 280—282 **4 Claims**



1. A pedicab comprising front frame means: driver seat means for an operator at the rear end of said front frame means; front wheel means rotatably mounted on said frame means for rotation around a horizontal axis substantially vertically aligned with said driver seat means; handle bar means for steering the pedicab located on the front end of said frame means in front of said driver seat means; pedal means on said frame means substantially vertically aligned with said handle bar means; drive means connecting said pedal means with said front wheel means for driving said wheel means to propel the pedicab; and cab means pivotally connected to the rear end of said frame means for movement therewith.

4,546,993

ADJUSTABLE MOTORCYCLE PASSENGER FLOORBOARD

George R. Walker, 2897 Palma Dr., Ventura, Calif. 93001

Filed Oct. 13, 1983, Ser. No. 541,601
Int. Cl.⁴ B62J *25/00*
U.S. Cl. 280—291 **2 Claims**

1. An adjustable passenger floorboard in combination with a motorcycle comprising:

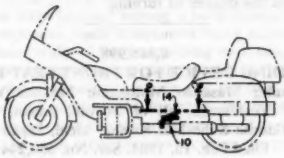
cylindrically shaped rail support means attached at its ends to the frame of a motorcycle and used for supporting said floorboard;

split clamp means extending from said floorboard and attached around and slidable on said rail support means for allowing a continuous adjustment of said floorboard along the track between said ends of said rail support means;

said clamp means includes a rectangular bar pivotally attached at one end to said floorboard and at its other end to said clamp means, said bar positioned in a notched recess in said clamp means for allowing said bar to be rotated

about its axis to any of said notches for adjusting the attitude of said floorboard relative to said motorcycle frame;

pivotal means between said floorboard and said clamping means for allowing said floorboard to be folded;



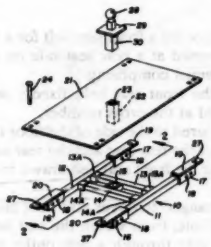
stop means on the bottom of said floorboard for preventing the floorboard from pivoting below said bar whereby adjusting the attitude of said floorboard is accomplished by axially moving said rectangular bar and reinserting said rectangular bar in another notched recess.

4,546,994

UNIVERSAL TRAILER HITCH

Jake E. Taylor, 7091 Tamarack Dr., Hubbard, Ohio 44425

Filed Oct. 26, 1983, Ser. No. 545,435
Int. Cl.[4] B60D *1/06*
U.S. Cl. 280—423 R **5 Claims**



1. A universal trailer hitch assembly to be positioned to a frame of a pickup truck comprising a main support frame including at least two spaced parallel tubular members, cross support members, means for securing said cross support members to said spaced parallel tubular members, a hitch support secured to said cross support members, movable sleeves on the ends of said spaced parallel tubular members, a bracket on each of said sleeves for securing the same to said frame of the pickup truck and to a truck bed, a reinforcing bed plate secured to said main support frame, means for securing said reinforcing bed plate to said truck bed and said main support frame and to said truck frame, a trailer hitch movably secured within said hitch support, means for selectively locking said trailer hitch within said hitch support.

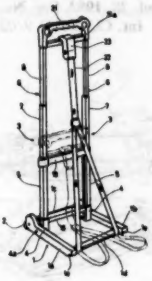
4,546,995

COLLAPSIBLE LUGGAGE CARRIER

Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushikikaisha, Osaka, Japan

Filed Dec. 5, 1983, Ser. No. 558,186
Claims priority, application Japan, Dec. 18, 1982, 57-191979
Int. Cl.[4] B62B *1/00*
U.S. Cl. 280—655 **10 Claims**

1. A handcart comprising: a baggage support having wheels; right and left handle bars attached to opposite sides of said baggage support, each handle bar comprising a lower bar and an upper bar longitudinally slidable and having a portion overlapping said lower bar, the slide movement between the upper and lower bars enabling the handle bars to be extended and contracted in a telescoping manner; engaging means for selectively inhibiting the slide movement between the lower and upper bars in the fully extended state of the handle bars, said engaging means being positioned in the upper end portion of each lower bar where the lower bar overlaps the lower end portion of the upper bar in said fully extended state; spring means for imparting an engaging motion to said engaging means; operating means positioned adjacent the lower end of said lower bar for imparting a disengaging motion to said engaging means against the resiliency of said spring; interlocking means for operatively connecting said operating means and said engaging means, wherein each of said lower bars comprises a pipe capable of slidably holding the associated upper bar in said telescopic manner, said engaging means comprising an engaging pin adapted to come in and out of the lower bar through a throughgoing hole formed in the lateral wall of the upper end portion of each of said pipes forming said lower bars, and a pawl positioned at the lower end of each of said upper bars and engageable with said engaging pin, a transverse bar connected between the upper ends of said lower bars, and wherein said engaging pins are housed in said transverse bar.

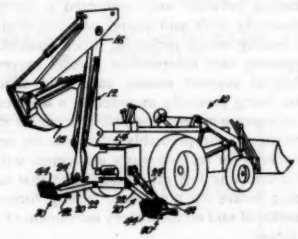


4,546,996

MULTI-SURFACE STABILIZER PAD ASSEMBLY

Charles B. Hanson, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Jun. 18, 1984, Ser. No. 621,686
Int. Cl.[4] B60S *9/10*
U.S. Cl. 280—764.1 **14 Claims**



1. A selectively positionable ground-engaging pad assembly for a vertically movable stabilizer arm of a material handling implement, comprising:

pad bracket means pivotally connected to a free end of said stabilizer arm for relative pivotal movement about a first axis;

a pad member having first and second portions respectively defining first and second ground-engaging surfaces;

means pivotally connecting said pad member to said bracket means for pivotal movement of said pad member with

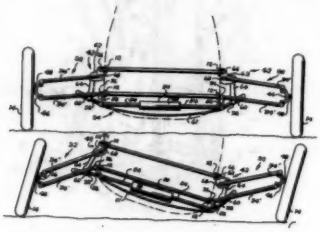
respect to said bracket means about a second axis which extends at an acute angle with respect to said first axis; and means for selectively locking a selected one of said first and second ground-engaging surfaces in a generally downwardly facing disposition for supporting said stabilizer arm.

4,546,997

VEHICLE STEERING AND SUSPENSION SYSTEM

Eugene D. Smyers, Hendersonville, N.C., assignor to John Shuttleworth, Hendersonville, N.C.

Filed Jul. 28, 1983, Ser. No. 518,203
Int. Cl.⁴ B62D *9/02*
U.S. Cl. 280—772 **35 Claims**



1. In a wheeled vehicle of the type having a vehicle frame, two wheels mounted on opposite transverse sides of said frame, and at least one wheel mounted on said frame at a longitudinal spacing from said transverse wheels, an improved steering and suspension means for said vehicle adapted to induce leaning of said frame during turning of said vehicle, comprising:

(a) respective support means for said transverse wheels pivotably mounted independently at said opposite sides of said frame about respective generally horizontal axes,

(b) connecting means affixed respectively to each said support means and arranged for reciprocatory movement for actuating opposed, substantially equal pivotal movement of said support means, said connecting means including a respective biasing means affixed to said support means for urging said support means into respective equilibrium dispositions relative to said connecting means for movement therewith and being yieldable for permitting independent pivotal movement of each said support means, respective connecting link arm means operatively affixed rigidly to said biasing means and reciprocating means extending between and connected at its opposite ends respectively with said connecting link arm means, each said biasing means including shock absorbing means for dampening said independent pivotal movements of the associated support means, each said shock absorbing means being pivotally mounted at a selected location on the respective connecting link arm means and extending therefrom to and pivotably affixed to the respective support means for reciprocatory movement with the respective connecting link arm means such that said shock absorbing means do not create biasing forces resistive to actuation of said reciprocatory movement of said connecting means

(c) steering means operatively connected with at least one of said vehicle wheels for actuating turning movement thereof transversely of its rotational axis for turning of said vehicle, and

(d) actuating means operatively associating said connecting means with said steering means for actuation of said reciprocatory movement of said connecting means upon said turning of said one wheel to actuate said opposed pivotal movement of said support means proportionately to the degree of said turning to effect upward pivotal movement of said support means inwardly of the direction of turning and equivalent downward pivotal movement of the other support means,

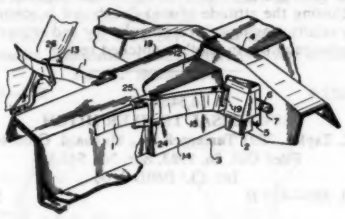
whereby said transverse wheels are independently supported biasingly for independent movement relative to said frame while, during turning of said vehicle, said frame is caused to lean in the direction of turning proportionately to the degree of turning.

4,546,998

GUIDING DEVICE FOR FRONT SEAT BELTS

Ichiro Suzuki; Masanao Motonami; Makoto Yamada, and Noritada Yoshitsugu, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Feb. 15, 1984, Ser. No. 580,244
Claims priority, application Japan, Feb. 22, 1983, 58-24602[U]
Int. Cl.⁴ B60R *21/10*
U.S. Cl. 280—807 **9 Claims**



1. A guiding device for a front seat belt for a vehicle having a cross member formed at a rear seat side on an automotive floor and a floor tunnel comprising:

a retractor for the front seat belt, fixedly secured into an opening formed at the cross member,

a boot fixedly secured to the side of the floor tunnel between the front side of the rear seat and the rear side of the front seat for guiding the front seat belt drawn from said retractor, and

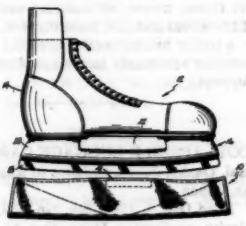
a floor carpet arranged to cover said boot and formed with a belt passage hole, from which the seat belt is drawn to the front seat side through a belt outlet formed at said boot.

4,546,999

FLEXIBLE SKATEGUARD

Steven R. Lehr, Box 272, Wadena, Minn. 56482

Filed Oct. 12, 1983, Ser. No. 541,133
Int. Cl.⁴ A63C *3/12*
U.S. Cl. 280—825 **4 Claims**



1. A skate blade guard for use with an ice skate having a blade mounted to a sole of a skate boot and an opening between the sole and the blade, the guard comprising:

a skate blade receiving pouch having first and second flexible wall portions joined at the bottom and at least one end to form an enclosure having a top opening for receiving the skate blade, the wall portions being sufficient in height

to extend past the opening of the skate blade the wall portions having an inner wall of fabric, an outer wall of flexible fabric and a cushioning material between the inner and the outer walls, the wall portion being sufficiently flexible so that the pouch is easily folded and reinforcement means made of flexible material located adjacent the bottom of the pouch along its inner wall; and

a hook and loop fastener having a hook component and a loop component, each component being attached to one of the inner walls of fabric opposing each other and situated adjacent the opening of the pouch so that when the blade is inserted into the pouch and the first and second wall portions are brought together, the hook and loop components extend through the opening of the skate blade and contact each other thereby securing the pouch to the ice skate blade.

4,547,000

SOFT-COVER BOOK BLOCK AND METHOD FOR THE MANUFACTURE OF SAME

Pentti Sallinen, Kurjentie 7 A, 06100 Porvoo 10, Finland

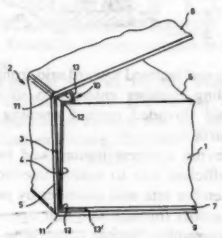
PCT No. PCT/FI82/00014, § 371 Date Dec. 22, 1982, § 102(e) Date Dec. 22, 1982, PCT Pub. No. WO82/03824, PCT Pub. Date Nov. 11, 1982

PCT Filed Apr. 29, 1982, Ser. No. 456,014

Claims priority, application Finland, May 5, 1981, 811377

Int. Cl.[4] B42D *1/00, 3/00;* **B42C** *11/00*

U.S. Cl. 281—23 **9 Claims**



1. A soft-cover book comprising a book block comprising a plurality of leaves joined together and forming a back having a width and back edges, a soft cover comprising front and back cover pieces connected by a spine, and a fastening member interposed between the spine of said soft cover and the back of said book block so that the spine of said soft cover is apart from the back of said book block, wherein said fastening member comprises at least one collapsed tubular sleeve, whose circumference is collapsed across said width, said collapsed tubular sleeve being at one side, fastened to the back of said book block and, at the opposite side, to the spine of said soft cover, wherein said circumference of the sleeve is larger than twice said width, so that the sleeve extends beyond said back edges a distance between the first of said leaves and the front cover piece and a distance between the last of said leaves and the back cover piece.

7. A method of manufacturing a soft-cover book, comprising the steps of:

forming a book block having first and last leaves and a back with a width and back edges;

forming a soft cover having front and back cover pieces and a spine connecting said pieces along spine edges;

forming a collapsible tubular fastening sleeve;

fastening said fastening sleeve to the spine of said soft cover;

fastening said book block at its back to said fastening sleeve in a manner compressing said fastening sleeve between said soft cover and said book block;

wherein said fastening sleeve is constructed from material non-penetrable by glue and said fastening steps are accomplished with glue; and

wherein during the glueing steps, narrow glue-free strips are allowed to remain on portions of the sleeve positioned between the front cover and the first leaf and between the back over and the last leaf.

4,547,001

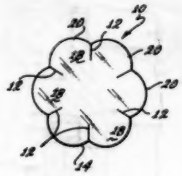
PRESSURE SENSITIVE LABEL WITH SURFACE CONFORMING LOBES

Edward M. Stitt, Burbank, Calif., assignor to Sam Allenberg, Burbank, Calif.

Filed Sep. 19, 1983, Ser. No. 533,107

Int. Cl.[4] B42D *15/00;* **B32B** *3/10*

U.S. Cl. 283—81 **8 Claims**



1. A label adapted to be applied without wrinkling to a surface of convex or otherwise irregular shape such as the surface of an item of fruit, comprising:

a flat flexible sheet member of generally oval configuration having a pressure sensitive adhesive material on its under side;

said sheet member having a series of radial slits formed therein around the entire circumference of said member and forming, between adjacent slits, a corresponding series of relatively independent, radially extending tabs;

whereby when said sheet member is applied to a convex or otherwise irregular surface, each one of said tabs may move in three dimensions relative to the adjacent tabs as may be necessary for said sheet member to conform to the surface without wrinkling.

4,547,002

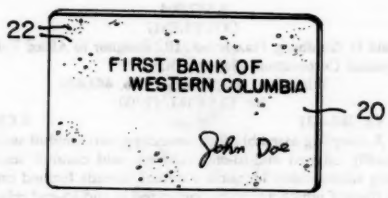
CREDIT AND IDENTIFICATION CARDS HAVING PIECES OF DIFFRACTION GRATING THEREIN

Gilbert Colgate, Jr., New York, N.Y., assignor to U.S. Banknote Corporation, New York, N.Y.

Filed Nov. 10, 1983, Ser. No. 550,401

Int. Cl.[4] B42D *15/00*

U.S. Cl. 283—91 **5 Claims**



1. An information bearing card with a substrate having an extended surface with a plurality of pieces of a diffraction grating randomly distributed therein and each, in response to incident light, reflecting light having unique optical characteristics uniquely and visually identifying the grating and therefore the card source.

4,547,003

PIPE CONNECTORS

John D. McGugan, Aberdeen, Scotland, assignor to Hunting Oilfield Services (U.K.) Limited, Aberdeen, Scotland

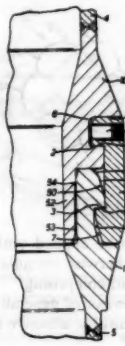
Continuation-in-part of Ser. No. 560,278, Dec. 13, 1983, Pat. No. 4,460,201, which is a continuation of Ser. No. 233,575, Feb. 11, 1981, abandoned. This application Jan. 19, 1983, Ser. No. 459,119

Claims priority, application United Kingdom, Jan. 27, 1982, 8202273

The portion of the term of this patent subsequent to Jul. 17, 2001, has been disclaimed.

Int. Cl.⁴ F16L *21/06*

U.S. Cl. 285—27 **15 Claims**



1. A pipe connector for connecting the abutted end portions of two pipes each of which is provided with an outwardly extending surface transverse of the axis of the respective pipe and directed away from the respective pipe end, comprising a split annular ring for surrounding the abutted pipe end portions substantially completely and having a pair of inwardly extending surfaces transverse to the axis thereof and directed towards each other and for engagement with a respective one of the surfaces on the pipe end portions, means for retaining said ring relative to one of said pipe end portions such that, in use, said ring is permanently engaged with said one pipe end portion, wherein said ring is resiliently expandable to permit engagement of the other pipe end portion therewith, corresponding surface portions of said ring and said other pipe end portion being so shaped that said ring is automatically expanded as said other pipe end portion is progressively engaged therewith, and guide means are provided for maintaining alignment of said pipe end portions during engagement of said other pipe end portion with said ring.

4,547,004

COUPLING

Harold D. Goldberg, Hazelcrest, Ill., assignor to Allied Tube & Conduit Corporation, Harvey, Ill.

Filed Dec. 10, 1982, Ser. No. 448,434

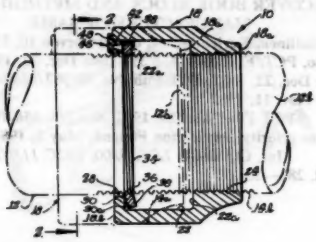
Int. Cl.⁴ F16L *19/00*

U.S. Cl. 285—31 **4 Claims**

1. A coupling assembly for connecting two conduit sections in axially aligned end-to-end relation, said conduit sections having substantially identical external threads formed on the ends thereof which are to be connected in end-to-end relation, said coupling assembly comprising:

an integral annular outer coupling member having a forward end, a rear end and an internal chamber extending between said ends and of sufficient size to freely receive the threaded end of either of said conduit sections therein, said forward end having a generally circular forward opening communicating with said chamber and defined by an internal surface having a pipe thread for engagement with the threads on said conduit ends, said rear end having a radial inwardly directed flange defining a generally circular rear opening aligned with said forward opening, communicating with said chamber and having a diameter greater than the outside diameters of said conduit sections, said forward end having a forward abutment surface facing said chamber and said flange having a rear abutment surface facing said chamber; and

an inner annular coupling member disposed within said chamber and axially movable therein, said inner coupling member being captively held between said foward end and said rear end, said inner coupling member having a threaded central opening enabling threaded connection with the threaded end of either of said conduit sections, said inner coupling member further having a plurality of spaced radial projections extending away from said central opening and inclined toward said front end so that said inner coupling member enters into sliding engagement adjacent said threaded central opening with said rear abutment surface,



said flange having a recess joining said rear opening and being of sufficient size to enable insertion of said inner coupling member into said chamber by passing said inner coupling member through said rear opening and recess,

said coupling assembly further comprising a tool having a generally straight arm extending through said recess and between said projections with said inner coupling engaging said rear abutment surface whereby rotation of said outer coupling member results in rotation of said inner coupling member either to remove the inner coupling member from a conduit section after it has been mounted thereon, or to install said inner coupling member on a conduit section.

4,547,005

CONNECTING PIPE PART OF A RESILIENT MATERIAL

Eduard Soederhuyzen, 330 Staalmeesterslaan, 1057 PC Amsterdam, Netherlands

Filed Aug. 10, 1982, Ser. No. 406,866

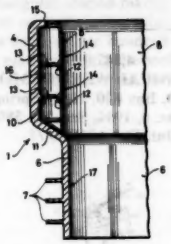
Claims priority, application Netherlands, Aug. 17, 1982, 8103780

Int. Cl.⁴ F16L *55/00*

U.S. Cl. 285—58 **5 Claims**

1. A connecting pipe part of a resilient material adapted to connect a closet bowl to a drain conduit and comprising on one end a female part for receiving an outlet of a closet bowl and on the other end a male part adapted to be received into a drain pipe or conduit, a sealing sleeve connected with the female part extending within the female part, the inner side of the female part being provided with flexible support members which extend substantially to the sealing sleeve, said support members comprising end parts extending substantially parallel to the inner side of the female part, as well as said sleeve, and

merging through rounded portions into remaining flange like parts of the support members, said flange like parts, extending



substantially radially with respect to the female part, said end parts being thinner than the flange like parts.

4,547,006

LUGGAGE CLOSING DEVICE

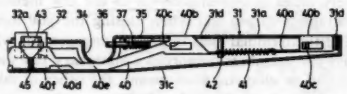
Philippe Castanier, Geneuille, France, assignor to Superior S.A., Besancon, France

Continuation-in-part of Ser. No. 192,502, Feb. 20, 1980, abandoned. This application Dec. 1, 1982, Ser. No. 445,948

Claims priority, application France, Jun. 22, 1978, 78 20084; May 25, 1979, application France, 7900040

Int. Cl.⁴ E05C *1/14*

U.S. Cl. 292—37 **11 Claims**



1. A piece of luggage comprising two parts connected by a hinge, one of said parts being a bottom and the other a cover, and a device for closing said piece of luggage, said closing device comprising an elongate case extending along a side of one luggage part opposite the hinge and an elongate keeper extending along a side of the other luggage part opposite the hinge and facing said case, said keeper having a plurality of spaced hasps projecting toward said case, and said case comprising a pair of parallel flat plates and means for maintaining the relative spacing between said plates, one of said plates having spaced apertures positioned to receive said hasps, and closing means in said case comprising latch means for releasably engaging said hasps to retain them in said apertures, spring means biasing said latch means to a hasp-retaining position and central manually operable operating means for moving said latch means to release said hasps, said operating means comprising a push button having cam means engageable with said latch means to move the same when said button is depressed, said cam means comprising a cam slidably mounted on said push button and said push button comprising locking means which in one condition secures said cam to said push button for actuation of said latch means when said push button is depressed and in another condition releases said cam from said push button so that said latch means is not actuated when said push button is depressed.

4,547,007

FUSE CARRIER UNIT FOR MOTOR VEHICLES

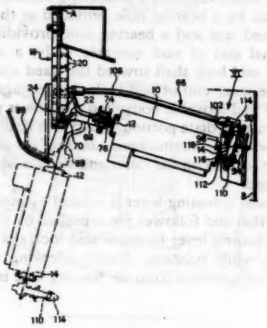
Ettore Parisi, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Nov. 12, 1982, Ser. No. 441,009

Claims priority, application Italy, Dec. 3, 1981, 53864/81[U]

Int. Cl.⁴ E05C *17/52*

U.S. Cl. 292—84 **11 Claims**



1. Fuse carrier unit for motor vehicles, comprising a fuse carrier box and means for attaching the box to a wall which defines the front of the passenger compartment of a motor vehicle and includes a substantially vertical lower portion and substantially vertical upper portion offset inwardly of the passenger compartment relative to the lower portion, wherein the fuse carrier box is fixable to said wall so as to extend in a downwardly inclined position between said upper portion and said lower portion, and the attachment means for the fuse carrier box include support means for moveably supporting said fuse carrier on said upper portion and clasp means for retaining the box in the downwardly inclined position and releasing means associated with the clasp means for allowing the box to move on said support means into a substantially vertical position beneath the upper portion of said wall to permit any renewal of the fuses contained in said box.

4,547,008

LOCK FOR REFRIGERATOR OR THE LIKE WHICH CAN BE UNLOCKED FROM INSIDE THEREOF

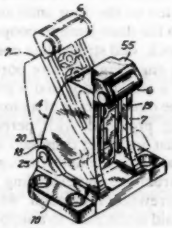
Kunuhiko Takasaki, Chiba, Japan, assignor to Takigen Seizou Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1984, Ser. No. 582,431

Claims priority, application Japan, Feb. 28, 1983, 58-28305[U]

Int. Cl.⁴ E05C *15/02*

U.S. Cl. 292—341.15 **6 Claims**



1. A lock for a refrigerator or the like which can be unlocked from the inside thereof, said lock comprising:

a handle unit mounted on a door; and

a keeper mounted on a body frame wall of the refrigerator or

the like, said keeper being constituted by: a fixed seat secured to said body frame wall and provided in its center with a guide hole for a push rod provided inside the refrigerator or the like; and a movable body having at its distal end a keeper member with which a latch member of said handle unit comes in and out of engagement and having its outer proximal end pivotally attached to the outer end of said fixed seat, said keeper further having: an actuating lever having its outer end pivotally attached to the outer end of said fixed seat; a lock shaft slidably and rotatably received by a bearing hole provided at the inner end of said fixed seat and a bearing hole provided at the inner proximal end of said movable body; a spring slidably urging said lock shaft toward the fixed seat inner end so that the inner end of said lock shaft engages said bearing hole in said movable body; and a follower pin upstanding on an intermediate portion of said lock shaft, said follower pin having its proximal end abutting on an inclined cam surface formed on the outer end surface of said fixed seat inner end,

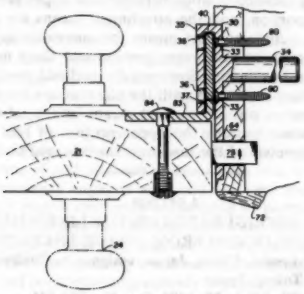
wherein said actuating lever is rotated by pushing said push rod so that said follower pin is pushed by the inner end of said actuating lever to cause said lock shaft to slide outwardly while rotating, thereby allowing the lock shaft inner end to escape from the bearing hole in said movable body.

4,547,009

STRIKE PLATE AND HINGE FOR A HIGH SECURITY DOOR SYSTEM

Mark L. Allen, 1776 E. 13th St., Brooklyn, N.Y. 11229

Filed Aug. 11, 1983, Ser. No. 522,325
Int. Cl.[4] E05C *21/00*
U.S. Cl. 292—346 **3 Claims**



1. A high security strike plate for a door structure in which a door opening in a wall is framed by a door jamb secured to a supporting wall structure and is closed by a door that abuts a door stop mounted on the door jamb and in which the strike plate is secured to the door jamb to cooperate with the bolt of a door mounted lock, said strike plate comprising a base member having a bolt engaging aperture portion adapted to align with the edge of a closed door and a portion extending outwardly beyond the outer surface of a closed door, said extending portion being provided with perpendicularly disposed buck pin means that are offset from said aperture portion so as to project from said base member through a door jamb into a supporting wall structure, said extending portion further being provided with screwholes through which screws may be driven to secure said strike plate to a supporting wall structure, a cover plate secured in spaced relationship to the extending portion of said base member to form a three sided recess which is open towards the aperture portion of said base member but which is closed by the outer surface of a closed door, said cover plate being provided with apertures aligned with the screwholes in said extending portion to permit a screwdriver to be inserted through said apertures to drive screws through said screwholes, and a guard member slidable into said recess to block access to screws that secure said strike plate to the wall structure.

4,547,010

MECHANICAL WEED REMOVER

Walter M. Camp, P.O. Box 620, Holly Springs, Ga. 30142

Filed Mar. 6, 1984, Ser. No. 586,557
Int. Cl.[4] A01B *1/18*
U.S. Cl. 294—50.9 **14 Claims**

1. A mechanical weed removal device comprising a pair of relatively movable jaw members, and means for moving the jaw members into and out of weed-gripping engagement, wherein terminal ends of the respective jaw members are respectively offset in closed position of the jaw members to prevent scraping up top soil when closing the jaw members with one of the terminal ends in ground engagement wherein one of said jaw members comprises a stationary jaw member on one end of an elongate shaft means, the other of said jaw members being mounted on the shaft means for movement toward and away from said one jaw member, the terminal edge of the stationary jaw member overlapping the terminal edge of the other jaw member so that when the terminal edge of the one jaw member is in ground engagement, the terminal edge of the other jaw member clears the ground, the device further including handle means on the other end of said shaft means, the handle means including operating means for the other of said jaw members, wherein the operating means comprises a hand lever pivoted on the shaft means and connected to the other jaw member by a linkage means extending along the shaft means, and the device including engageable and disengageable locking elements on the hand lever and a hand grip portion of the shaft means respectively for releasably clamping the jaw members in weed-gripping engagement, wherein the locking elements comprise complementary opposed ramp-like elements mutually cammed into locking engagement when the hand lever is moved towards the hand grip and released by relative lateral displacement of the hand lever and hand grip.

4,547,011

SNO-RAK

Isaac Stewart, Jr., 71 Sheridan St. NE., Washington, D.C. 20011

Filed Feb. 5, 1985, Ser. No. 698,237
Int. Cl.[4] B05B *7/02*
U.S. Cl. 294—54.5 **1 Claim**

1. A Sno-Rak or tool used for removing snow from flat,

horizontal surfaces such as steps, porches and sidewalks as the user stands above it, the combination comprising:

a. a straight triangular shaped raking plate;

b. a fin integral with the outer edge of the plate, said fin breaks on an angle at one hundred five degrees from the plane of the plate, enabling the tool to bite, grip and hold an area of snow to be removed during the raking process;

c. a tubular ferrule in integral with the upper end of said plate for permanently attaching a handle;

d. the plate is located between the fin and the ferrule which enables the user to remove snow in manageable amounts; and

e. said plate consists of sixteen gauge metal.

4,547,012

TIRE LOADER

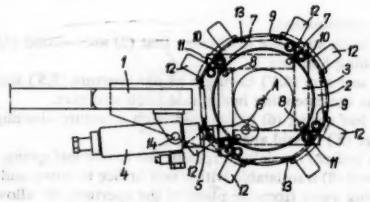
Gerd Krebs, Hamburg, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Fed. Rep. of Germany

Filed Apr. 22, 1983, Ser. No. 487,587

Claims priority, application European Pat. Off., Apr. 28, 1982, 82103605.0

Int. Cl.⁴ B66C *1/54*

U.S. Cl. 294—93 **9 Claims**



1. A tire loader comprising:

a support having an upright axis;

at least three like abutments angularly equispaced about and radially equispaced from the axis on the support;

a plate pivotal about the axis on the support within the abutments;

at least three respective inner pivots angularly equispaced about and radially equispaced from the axis on the plate;

at least three respective arms each having radially inner ends pivoted on the respective pivots and outer ends, each arm having an edge bearing angularly on the respective abutment;

biasing means operatively connected between the outer arm ends for urging the outer arm ends radially inward and thereby pressing the edge of each arm angularly against the respective abutment;

at least three respective bead-engaging shoes pivoted on the outer ends of the respective arms; and

means including an actuator operatively connected between the support and the plate for rotating the plate about the axis on the support and thereby pivoting the arms between inner positions extending generally tangentially of the axis and outer positions extending generally radially outward therefrom about the inner pivots, sliding the arm edges along the respective abutments, and moving the shoes radially.

4,547,013

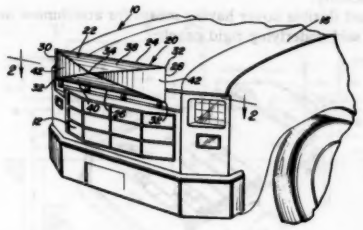
VEHICLE BUG DEFLECTOR

Thomas I. McDaniel, Aztec, N. Mex., assignor to Tomahawk Industries, Inc., N. Mex.

Filed Jun. 28, 1984, Ser. No. 625,797

Int. Cl.⁴ B60J *1/20*

U.S. Cl. 296—1 S **7 Claims**



1. In combination with a vehicle including a forward upstanding grille area having an upper marginal portion, a hood extending generally horizontally rearwardly from the upper marginal portion of said grille area and with said hood including a forward marginal portion which curves downwardly toward said upper marginal portion of said grille area, a vehicle bug deflector, said bug deflector comprising a horizontally elongated edge upstanding panel member extending transversely of said vehicle closely forward of said forward marginal edge portion, said panel member including vertically spaced generally horizontal upper and lower marginal edges and upstanding end edges extending between corresponding ends of said upper and lower marginal edges, the upper and lower end portions of said end edges intersecting with adjacent ends of said upper and lower marginal edges at four corner areas of said panel member disposed in an upstanding plane, said panel member including a central area thereof forwardly laterally spaced from said plane, the forward side of said panel member including four generally planar surfaces converging toward said central area and including an upper surface extending between and interconnecting the two upper corner portions of said panel member and said central area, a lower surface extending between and connecting the two lower corners and said central area and a pair of opposite side surfaces each extending between and connecting the corresponding upper and lower corners of said panel member and said central area, and means supporting said panel member from said vehicle with the lower marginal edge portion of said panel member extending along and spaced slightly forward of said forward marginal portion.

4,547,014

ARTICULATED RIGID COVER ASSEMBLY FOR TRUCK BEDS

James A. Wicker, 209 Carbonton Rd., Sanford, N.C. 27330

Filed Jan. 16, 1984, Ser. No. 570,979

Int. Cl.⁴ B60P *7/04*

U.S. Cl. 296—100 **3 Claims**

1. An accordion-like folding cover assembly for open truck beds which have front and side walls and a hinged tailgate, said cover assembly comprising:

(a) a pair of track members mounted one on each side of said side walls; said track members including an attachment means for securing said track to the upper surface of said side walls, and said attachment means being concealed from visibility and access from outside said truck bed;

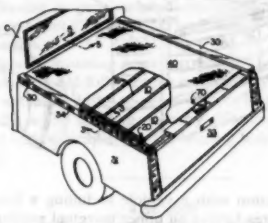
(b) an articulated rigid cover formed of a plurality of rigid,

elongated panels extending across said open truck bed, said panels including a hinge means for hingedly connecting the panels to each other along the sides thereof;

(c) guide means attached to selected ones of said plurality of panels for engagement with said track members to guide the movement of said panels along said track members between an open and closed position;

(d) a flexible cover member of continuous sheet material overlying said plurality of rigid panels for rendering said articulated rigid cover substantially water impervious and for improving the esthetic appearance of the overall cover assembly;

(e) said flexible cover having means for attachment to each of said underlying rigid panels;



(f) locking means mounted on the rear end of said articulated rigid cover and cooperating with said track members for retaining said cover assembly along said track members in a selected one of a plurality of positions;

(g) said attachment means including a bracket means depending downwardly from said track, said bracket means being L-shaped and having a vertical portion and a horizontal portion; said vertical portion depending downwardly from the undersurface of said track such that said horizontal portion is underneath and parallel to the undersurface of said track and spaced therefrom;

whereby as said cover assembly is opened, it may be folded accordion-like toward the truck cab and locked in any one of a plurality of positions intermediate the tailgate and the cab, or in the closed position may be pulled to its fully extended length whereby said truck bed is fully closed and locked.

4,547,015

FOLDING CANVAS CHAIR

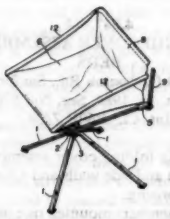
Yasuo Wakimoto, No. 3-6, Nishiasakusa 1-chome, Taito-ku, Tokyo, Japan

Filed Nov. 3, 1982, Ser. No. 438,738

Claims priority, application Japan, Nov. 6, 1981, 56-164875[U]

Int. Cl.⁴ A47C *4/00*

U.S. Cl. 297—16 **3 Claims**



1. A canvas chair comprising:

a base plate having four apertures formed therethrough;

four rods extending through said four apertures, respectively, each of said rods being pivotally connected to said base plate intermediate opposite ends thereof;

a pair of connecting members of generally L shape each having a base portion, said base portions being fixedly secured to the upper ends of two adjacent ones of said four rods, respectively, a pair of parallel spaced webs extending outwardly from the upper end of said base portion;

a pair of supporting posts each received between and connected to said webs of a respective one of said connecting members for rearward pivotal movement; and

a sheet of canvas having a seat portion and a back portion extending therefrom, two corners of said seat portion remote from said back portion being connected to the upper ends of the other two rods, respectively, said back portion being supported on said supporting posts, and said canvas sheet having a pair of flexible straps each extending between said corner of said seat portion and the upper corner of said back portion.

4,547,016

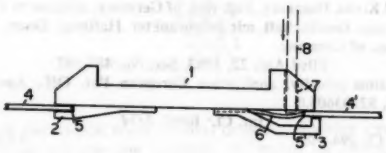
QUICK RELEASE MOUNTING

Henry Gabrielian, Newport Beach, Calif., assignor to EECO Incorporated, Santa Ana, Calif.

Filed Aug. 13, 1984, Ser. No. 640,298

Int. Cl.⁴ A47C *7/62*

U.S. Cl. 297—194 **5 Claims**



1. In combination,

(a) a latch structure (1) having first (2) and second (3) extending lips, and

(b) a seat arm (4,4') having a planar aperture (5,5') smaller than the extending lips of said latch structure,

(c) a leaf spring (6) below said latch structure abutting an edge (5') of said aperture,

(d) an orifice (7) axially perpendicular to said leaf spring, and

(e) a rod (8) translatable within said orifice to move said leaf spring away from the plane of the aperture, for allowing translation of said latch structure within said aperture for removing said latch structure from said aperture.

4,547,017

ARTICULATED CHAIR

Jacques Lescure, Is-sur-Tille, France, assignor to AMI, Is-sur-Tille, France

PCT No. PCT/FR83/00078, § 371 Date Dec. 23, 1983, § 102(e) Date Dec. 23, 1983, PCT Pub. No. WO83/03957, PCT Pub. Date Nov. 24, 1983

PCT Filed Apr. 27, 1983, Ser. No. 568,231

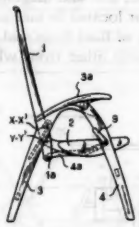
Claims priority, application France, May 19, 1982, 82 08778

Int. Cl.⁴ A47C *1/02*

U.S. Cl. 297—318 **10 Claims**

1. An articulated chair comprising at least a back rest and a chair seat pivoted to each other about a displaceable first axis, the back rest being pivotally attached to a support about a second axis which is parallel to said first axis and is stationary with respect to the chair, said back rest and said seat being continuously displaceable with respect to each other between a position in which the back rest is substantially vertical and the seat is substantially horizontal and a position in which the back rest and the seat are substantially horizontal; the improvement wherein the displacement of the chair seat is guided at the

end opposite to said first axis along a curve such that when the back rest and the seat undergo a displacement between the two said positions, the center of gravity of the chair user's body moves away from a horizontal plane over a distance which is sufficiently short to ensure that the user can modify the relative



position of the back rest and of the seat by exerting acceptable efforts on those latter without any need to rise from the chair, rollers carried by a stationary part of the chair on opposite sides of the chair seat, and arcuate grooves in opposite sides of the chair seat in which said rollers roll to guide said opposite end of said chair seat along said curve.

4,547,018

CLAMPING MEANS FOR A STRAP

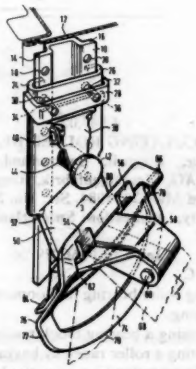
Douglas J. Cunningham, Lutterworth, England, assignor to Britax (Wingard) Limited, United Kingdom

Filed Nov. 15, 1984, Ser. No. 671,577

Claims priority, application United Kingdom, Nov. 30, 1983, 8331980; Dec. 15, 1983, 8333476; Mar. 2, 1984, 8405559

Int. Cl.⁴ B60R *21/10*

U.S. Cl. 297—483 **8 Claims**



1. Clamping means for a strap, comprising a base member, a guide member pivotally mounted on the base member for angular movement about a first axis, a clamping member pivotally mounted on the base member for angular movement about a second axis parallel to the first axis and located at a greater radius from the second axis than the radius of the guide member from the first axis, resilient means for biasing the guide member and the clamping member into a rest position in which the strap is freely movable between the guide member and clamping member, and coupling means arranged so that angular movement of the guide member against the bias of the resilient means towards the plane containing the two pivot axes causes corresponding angular movement of the clamping member, thereby wrapping the strap round both the clamping member and the guide member.

4,547,019

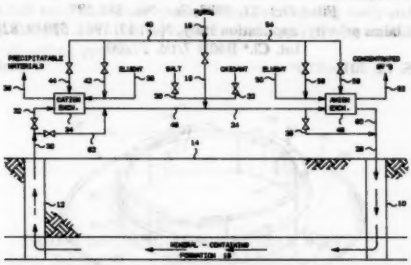
IN-SITU RECOVERY OF MINERAL VALUES WITH SULFURIC ACID

F. Morgan Warzel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 6, 1983, Ser. No. 492,278

Int. Cl.⁴ E21C *41/14*

U.S. Cl. 299—4 **11 Claims**



1. A method for recovering mineral values from a subsurface earth formation, containing calcium-containing materials in addition to such mineral values, comprising

(a) injecting into at least one injection well an aqueous sulfuric acid leach solution adapted to extract a significant amount of mineral values from said subsurface formation and containing a chloride salt, adapted to significantly increase the solubility of calcium sulfates in water, in an amount sufficient to thus increase the solubility of calcium sulfates in water;

(b) contacting said subsurface formation with said leach solution for a time sufficient to extract significant amounts of mineral values from said subsurface formation and produce a pregnant leach solution containing the thus extracted mineral values and to thus solubilize significant amounts of calcium sulfates and remove significant amounts of calcium from said subsurface formation; and

(c) withdrawing said pregnant leach solution from at least one producing well.

4,547,020

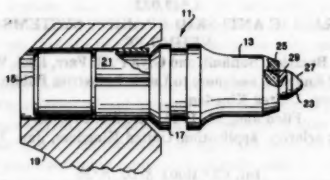
ROTATABLE CUTTING BIT

Randall W. Ojanen, Bristol, Va., assignor to GTE Products Corporation, Stamford, Conn.

Filed May 9, 1983, Ser. No. 492,970

Int. Cl.⁴ E21C *9/12*

U.S. Cl. 799—86 **4 Claims**



1. A rotatable cutting bit comprising a head portion, a shank portion depending from said head portion along a longitudinal axis, said head portion having a socket at the forward end, a hard insert having coaxially aligned an integral sections, said sections comprising a nose section, a base section, and an intermediate section contiguous said base and said nose section,

said intermediate section having a cavity at the rearward end, said base section comprising a material of greater thermal conductivity than said intermediate section, a portion of said base being disposed in said cavity and another portion exiting rearwardly in said socket for conducting heat away from the insert.

4,547,021

HUB CAP SECURING ARRANGEMENT ENGAGING WHEEL LUGS

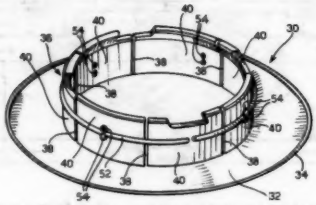
Silvano Abbate Daga, Turin, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

Filed Oct. 21, 1983, Ser. No. 544,287

Claims priority, application Italy, Nov. 17, 1982, 53939/82[U]

Int. Cl.⁴ B60B *7/06, 27/00*

U.S. Cl. 301—37 P **7 Claims**



1. A disc wheel assembly for motor vehicles and of the type including a disc provided with a plurality of equiangularly spaced holes through which a corresponding number of screws are received for attaching the assembly to the vehicle, with each screw having a diverging conical surface, and a hub cap detachably secured to the disc, which assembly comprises:

(a) the wheel disc including a plurality of raised portions corresponding to the number of holes and equiangularly spaced therebetween;

(b) the hub cap including a cylindrical skirt defined by a plurality of discrete axially directed resilient sectors, each sector terminating in a free end;

(c) the free ends of the sectors including a plurality of radially inwardly directed retaining projections and a plurality of recesses spaced between the projections, with each recess being of a circumferential width at least equal to the circumferential width of each raised portion;

(d) whereby the retaining projections engage the raised portions in one position of rotation of the hub cap, and the recesses engage the raised portions in a second position of rotation of the hub cap; and

(e) means for resiliently biasing the sectors radially inwardly for urging the retaining projections into engagement against the conical surfaces of the screws when the hub cap is disposed in the second position of rotation.

4,547,022

HYDRAULIC ANTI-SKID BRAKING SYSTEMS FOR VEHICLES

Malcolm Brearley, Solihull, and Glyn P. R. Farr, Leek Wootton, both of England, assignors to Lucas Industries Public Limited Company, United Kingdom

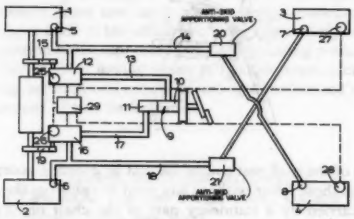
Filed Jan. 16, 1984, Ser. No. 570,752

Claims priority, application United Kingdom, Jan. 28, 1983, 8302458

Int. Cl.⁴ B60T *8/02, 8/26*

U.S. Cl. 303—6 C **10 Claims**

1. An anti-skid braking system for a four wheel vehicle having brakes on the front and rear wheels, wherein said system comprises first and seond brake-applying circuits, said first circuit comprising a first source of brake-applying fluid, and a first connection between the first source and the brake on one of said front wheels and the brake on the diagonally opposite one of said rear wheels, and the second circuit comprising a second source of brake-applying fluid, and a second connection between the brake on the other of said front wheels and the brake on the diagonally opposite other of said rear wheels, a first modulator located in said first connection for modulating the supply of fluid from said first source to both said brakes on the said one front wheel and said diagonally opposite rear wheel, a second modulator located in said second connection for modulating the supply of fluid from said second source to both said brakes on the said other front wheel and the said



diagonally opposite other rear wheel, four skid sensors, each for providing a skid signal dependent upon the behaviour of a respective one of said wheels, a control module for operating at least one of said modulators in accordance with the nature of at least one skid signal, and apportioning valves disposed between said modulators and said brakes on said rear wheels, said control module being constructed and arranged to ignore a skid signal from said sensor on one of said rear wheels until a skid signal is also received from said sensor on the other of said rear wheels, whereafter said control module is operative to operate one of said two modulators.

4,547,023

CIRCULATING ROLLER BEARING

Albrecht Blatter, Roggwil, Switzerland, assignor to W. Schneeberger AG, Maschinenfabrik, Roggwil, Switzerland

Filed Mar. 23, 1984, Ser. No. 593,290

Claims priority, application Switzerland, Apr. 18, 1983, 2060/83

Int. Cl.⁴ F16C *29/06*

U.S. Cl. 308—6 C **17 Claims**

1. A circulating roller bearing for cooperating with a bearing surface, comprising:

a housing comprising a bearing block made of plastic material and incorporating a roller raceway having a bearing portion and a circulating portion in nearly co-planar relationship;

rollers sequentially arranged in said raceway;

said rollers rolling between said raceway and said bearing surface;

said circulating portion being formed in said bearing block;

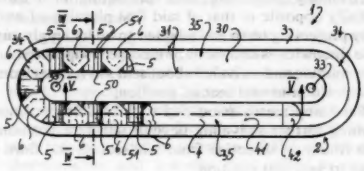
said bearing portion being constructed as a bearing raceway insert having a raceway surface and exending through said bearing block and interrupting said circulating portion;

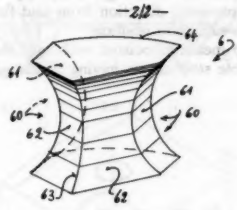
said bearing raceway insert having a mounting surface in a calibrated spaced relationship to said raceway surface;

said bearing portion having sloping ramp end regions defining transitions between said bearing portion and said circulating portion;

spacer members provided between said rollers; and

said spacer members being provided with concave roller quide surfaces, each of which comprise mutually substantially





parallel roller guide surface portions and mutually convergent roller guide surface portions.

4,547,024

CROSS-LINEAR SLIDE BEARING HAVING REDUCED THICKNESS FOR USE IN X-Y TABLE

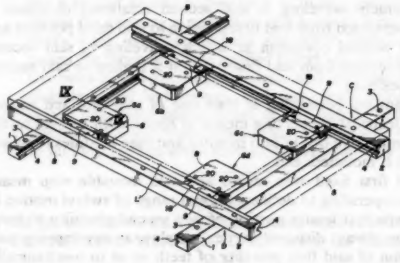
Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-ku, Tokyo, Japan

Filed Sep. 21, 1984, Ser. No. 652,899

Claims priority, application Japan, Sep. 27, 1983, 58-177010

Int. Cl.⁴ F16C *29/06*

U.S. Cl. 308—6 C **5 Claims**



1. A cross-linear slide bearing having a reduced thickness for use in an X-Y table comprising:

a pair of first track rails which are disposed on a securing part such as to be in parallel to each other and are respectively provided in the opposing inner surfaces thereof with loaded ball rolling grooves extending longitudinally;

a pair of second track rails which are attached to a movable table such as to be in parallel to each other and to cross said first track rails at right angles and are provided in the opposing inner surfaces thereof with loaded ball rolling grooves extending longitudinally; and

four bearing units which are respectively disposed at intersections between said first and second track rails and are adapted to linearly move relative to the corresponding track rails,

wherein each of said bearing units is composed of: a flat bearing body having a pair of outer side surfaces which are adjacent to each other at 90 degrees, said bearing body having first and second loaded ball rolling grooves which are respectively formed in said outer side surfaces such as to face the corresponding loaded ball rolling grooves on said first and second track rails and such as to be separate from each other vertically, said bearing body further having a non-loaded ball rolling groove which is provided horizontally inward of each of said first and second loaded ball rolling grooves and is connected to the corresponding loaded ball rolling groove, thereby forming an endless ball rolling passage for recirculating balls; a multiplicity of balls disposed within said endless ball rolling passage; and a ball retainer which is attached to said bearing body and is adapted to rollably retain the balls within said loaded ball rolling groove.

4,547,025

GUIDE BEARING FOR A LINEAR BODY

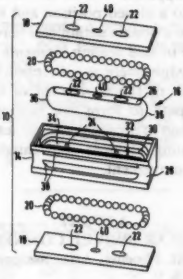
Hugo Isert, Bahnhofstrasse 33, D-6419 Eiterfeld 1, Fed. Rep. of Germany

Filed Feb. 22, 1984, Ser. No. 582,638

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1983, 3307993

Int. Cl.⁴ F16C *29/06, 31/04*

U.S. Cl. 308—6 C **7 Claims**



1. A guide bearing for a linear body, such as a shaft, a rod or the like, comprising in combination

(a) a housing having

(1) an interior space, and

(2) an exterior face in the form of an outwardly concave wall that has two spaced apart parallel elongated slots therein that are in open communication with said interior space,

(b) a runner body positioned in said interior so as to form with the interior of said housing two spaced apart parallel ball raceways located adjacent said elongated slots in said interior space, said raceways being in the form of endless loops and containing a plurality of balls, and

(c) cover plates which maintain said runner body in position within said housing, wherein the width of each of said two spaced apart elongated slots is less than the diameter of the balls which move past said slots in said raceways so that only a portion of said balls will protrude outwardly through said concave wall of the housing for contact with said linear body.

4,547,026

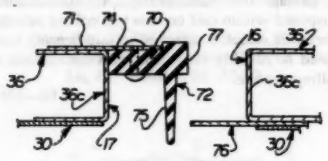
SEAL ARRANGEMENT FOR COMPACT STORAGE SYSTEMS

Robert J. French, Wadsworth, and Elmer F. Dorony, Parma, both of Ohio, assignors to Interior Steel Equipment Co., Cleveland, Ohio

Continuation of Ser. No. 394,146, Jul. 1, 1982, abandoned. This application Jul. 13, 1984, Ser. No. 630,992

Int. Cl.[4] D47B *53/02*

U.S. Cl. 312—201 **8 Claims**



7. A storage system comprising a plurality of adjacent storage units comprising first and second adjacent storage units having adjacent opposed sides, means for supporting said storage units for displacement relative to one another along a common linear path perpendicular to said opposed sides to move adjacent units between closed and open positions relative to one another, each of said opposed sides including means defining peripheral edge means extending thereabout, said storage units comprising wall means providing a closed, environmentally controllable compartment when said units are in closed position, sealing means mounted on and extending around the peripheral edge means of one of said adjacent opposed sides and cooperating with peripheral edge means of the said adjacent opposed side as the units relatively move along said path into a closed position and having two sealing elements to provide a double acting seal between said adjacent opposed sides, one of said sealing elements being compressed by said peripheral edge means in a direction essentially perpendicular to said path of the movement of said opposed sides along said linear path to form one sealing element of said double acting seal and to provide resilient sealing forces having with said one sealing element substantially no component along said path of movement.

4,547,027

MODULAR SWIVEL CONNECTOR

John A. Scheibenreif, Phoenix, Ariz., assignor to ITT Corporation, New York, N.Y.

Filed Feb. 21, 1984, Ser. No. 582,101

Int. Cl.[4] H01R *35/00*

U.S. Cl. 339—8 R **9 Claims**

1. In a cathode ray tube terminal having a base module and a monitor module, a swivel connector assembly for effecting the mechanical and electrical interconnection of said monitor module to said base module, said swivel connector assembly comprising:

a plateau portion defined in an upper surface of said base module;

first electrical connecting means mounted on said plateau portion;

a first circular locking ring having a first plurality of horizontally projecting teeth defined in said upper surface and surrounding said plateau portion;

a recessed portion defined in a lower surface of said monitor module;

second electrical connecting means mounted within said recessed portion and adapted to interconnect with said first electrical connecting means;

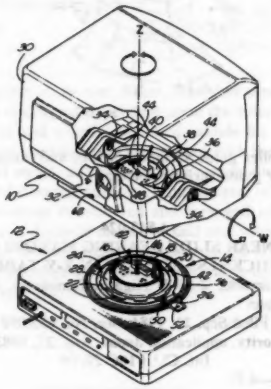
swivel support means for permitting said monitor module to be supported on said base module and to be swiveled about a swivel axis from a first position through a second position to a third position, said swivel axis extending upwardly from said plateau portion to said recess portion;

a second circular locking ring having a second plurality of horizontally projecting teeth projecting in a direction radially opposite to that of said first plurality of horizontally projecting teeth and adapted to be lockingly engageable therewith as said monitor module is supported on said base module and swiveled about said swivel axis from said first position to said second position;

first fixed stop means associated with said first position for limiting further swiveling beyond said first position in a first rotational direction from said second and third positions to said first position;

second fixed stop means associated with said third position for limiting further swiveling beyond said third position in a second rotational direction from said first and second positions to said third position;

movable stop means associated with said second position, said movable stop means having displaced condition at



which swiveling in said second rotational direction is permitted from said first position to said third position and a normal condition at which swiveling in said second direction from said first position is limited to said second position;

means for permitting at least one of said first and second electrical connecting means to rotate with respect to the respective one of said monitor and base modules to which it is mounted; and

said first fixed stop means and said movable stop means cooperating to define a normal range of swivel motion in which at least a portion of said second plurality of teeth are always disposed vertically below an overlapping portion of said first plurality of teeth so as to mechanically couple said monitor module onto said base module, said movable stop means and said second fixed stop means defining an extended range of swivel motion including said third position at which said first and second pluralities of teeth do not so overlap.

4,547,028

LOW PROFILE TEST CLIP

Thomas E. Morgan, Stow, Ohio, and John Tengler, Chico, Calif., assignors to A P Products Incorporated, Mentor, Ohio

Filed Oct. 5, 1983, Ser. No. 539,121

Int. Cl.[4] H01R *23/66*

U.S. Cl. 339—14 R **31 Claims**

2. A low profile clip connector for an electrical device that has plural rows of electrically conductive leads, comprising:

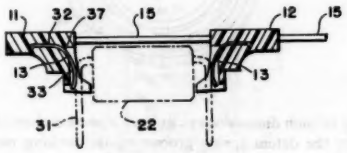
a pair of clip bodies, each including a plurality of electrical contacts and an electronically non-conductive support;

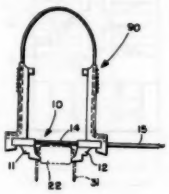
an electrical cable including a plurality of insulated electrical conductors;

a plurality of said electrical contacts being electrically connected to respective electrical conductors at respective junctions thereof;

said supports being molded to said cable and contacts to enclose said respective junctions while leaving respective contacting portions of said contacts exposed for connection to respective leads of such an electrical device; and

coupling means for coupling said pair of clip bodies with respect to each other for relative movement away from each other to enable insertion of the electrical device therebetween and towards each other to engage the





contacts to respective leads of the electrical device, said coupling means comprising a plurality of stacked leaf springs positioned at respective lateral ends of said bodies; and, in combination with said connector,

a handle for manipulating said connector, said handle including a pair of handle bodies each including gripping jaw means for gripping a respective clip body to form a relatively rigid extension thereof and force applying arm means for receiving force applied thereto to pivot respective pairs of said gripping jaw means and clip bodies while distorting said leaf springs, said jaw means being positioned proximate lateral edges of said handle bodies for positioning in approximately aligned position with respect to said leaf springs when so engaged with said clip bodies.

4,547,029

SELF-LOCKING ELECTRICAL AND MECHANICAL CONNECTING MEANS AND METHOD OF MAKING SAME

Thomas A. Kutnyak, Tucson, Ariz., and Thomas W. Tolbert, Greenwood, S.C., assignors to Automation Industries, Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 543,889, Oct. 20, 1983, abandoned. This application Oct. 19, 1984, Ser. No. 662,586

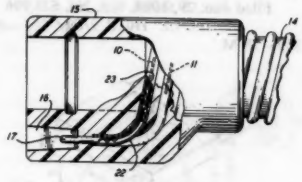
Int. Cl.⁴ H01R *11/08*

U.S. Cl. 339—16 R **12 Claims**

1. Self-locking electrical and mechanical connecting means between a nominally helical curved end-portion of a self-supporting resilient metal electrical wire-helix of a certain radius and an open-ended nominally straight-axis extended plastically deformable metal socket-portion of an electrical terminal comprising

(a) a wall defining said socket-portion and being plastically deformed tightly about the curved wire end-portion,

(b) said curved wire end-portion within the socket-wall being elastically deformed into a straighter configuration of a radius greater than said certain radius and the socket-portion being plastically deformed to said configuration of the wire, and



(c) whereby the plastically deformed socket-portion is self-locked onto the elastically deformed end-portion to form a resilient electrical and mechanical connection therebetween.

4,547,030

ELECTRICAL DISTRIBUTION SYSTEM

Peter R. Tanner, Barking, and Eric Chaplin, Eastleigh, both of England, assignors to Tanner Chaplin Tracks Ltd., Barking, England

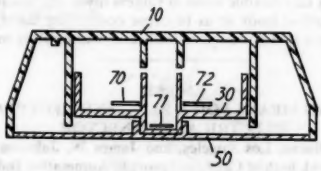
PCT No. PCT/GB82/00097, § 371 Date Nov. 5, 1982, § 102(e) Date Nov. 5, 1982, PCT Pub. No. WO82/03505, PCT Pub. Date Oct. 14, 1982

PCT Filed Mar. 30, 1982, Ser. No. 441,527

Claims priority, application United Kingdom, Mar. 31, 1981, 8109995; Jun. 11, 1981, 8117998; Sep. 15, 1981, 8127792

Int. Cl.⁴ H01R *9/00*

U.S. Cl. 339—21 R **9 Claims**



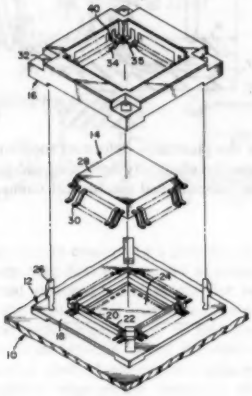
1. An electrical distribution system including a conduit comprising an elongate rear member and an elongate cover member, said cover member being of generally channel-shaped cross-section comprising a web portion and two arm portions and said cover member being attachable to said rear member by attachment means provided at the ends of said arm portions remote from said web portion, said conduit containing a plurality of electrical conductors and having therealong a plurality of socket positions adapted to receive an electrical plug member having contact pins, each said electrical conductor having along its length a series of contact elements, each said contact element being arranged to contact said pins of the electrical plug member, and said conduit further containing an elongate insulating member for preventing said electrical conductors from being exposed when said cover member is detached from said rear member, and said insulating member having means for attaching it to said cover member, wherein said insulating member also has means for attaching it to said rear member.

4,547,031

CHIP CARRIER SOCKET AND CONTACT

Iosif Korsunsky, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 29, 1984, Ser. No. 625,996
Int. Cl.[4] H01R *9/09*
U.S. Cl. 339—75 M **4 Claims**



1. A chip carrier socket, comprising:
a chip carrier having conductive leads;
contact means for providing electrical communication from said conductive leads therethrough;
base plate means being profiled to receive said chip carrier, having said contact means extending through said base plate means and being disposed adjacent said conductive leads;
retainer means being profiled to be place over said chip carrier and said base plate means and being fastened to said base plate, means characterized in that said retainer means has a cavity therein and a plurality of flexible arms or fingers in corresponding engagement with said conductive leads; and
spring carrier means disposed in said cavity for resiliently urging said flexible arms or fingers inwardly towards said conductive leads so as to cause contacting mating force between said conductive leads and said contact means.

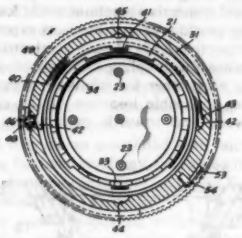
4,547,032

LOCKING MEANS FOR A PLUG AND RECEPTACLE ELECTRICAL CONNECTOR

Edgar A. Burns, Los Angeles, and James W. Johnson, North Hollywood, both of Calif., assignors to Automation Industries, Inc., Greenwich, Conn.

Filed Aug. 3, 1984, Ser. No. 637,545
Int. Cl.[4] H01R *13/625*
U.S. Cl. 339—90 R **7 Claims**

1. Locking means for an electrical connector having a receptacle, a plug, a coupling ring shell threaded on the plug which on rotation moves the plug and receptacle toward or away from each other depending upon the direction of rotation, a generally semicircular detent spring fixedly located on the outer surface of the plug and including projections which snap into recesses on the inner wall of the coupling ring shell when the receptacle and plug are fully mated and unmated, said detent spring having a groove on its outer convex surface, comprising:
the coupling ring shell having an opening extending therethrough which aligns with substantially the midpoint of the detent spring when the plug and receptacle are mated;
a locking ring received on said coupling ring shell and rotatable thereabout while fixedly located along the coupling ring shell longitudinal axis, said locking ring inner surface lying over the coupling ring shell opening throughout the full range of rotation and including a first recess which can be aligned with said coupling ring shell opening; and
means slidably received within the coupling ring shell open-



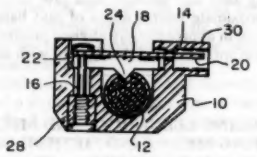
ing of such dimensions as to have a portion thereof forced into the detent spring groove by the locking ring inner surface adjacent the locking ring first recess on the coupling ring shell opening being aligned with the detent spring groove.

4,547,033

ELECTRICAL TAP CONNECTOR

Wayne White, Hillside, and Jim Williams, Lombard, both of Ill., assignors to Whisco Component Engineering, Inc., Elk Grove Village, Ill.

Filed Sep. 10, 1984, Ser. No. 649,133
Int. Cl.[4] H01R *9/08*
U.S. Cl. 339—97 R **2 Claims**



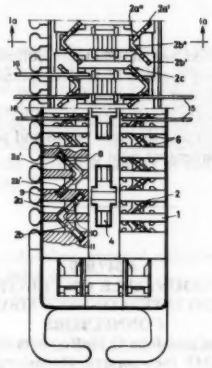
1. A connector for tapping electrical current from an insulated electrical cable at a point intermediate the ends of said cable, said connector comprising
a connector body formed of an electrically insulative material of a u-shaped configuration adapted to receive said cable, having a laterally extending slot through one leg adjacent the end thereof and a recessed vertical threaded aperature through the opposite leg thereof;
an insulation piercing electrically conductive tap formed at one end to provide an accessory lug disposed through said slot and extending outwardly from said body; and
a screw disposed through the end of said tap opposite said accessory lug and threaded into the recessed vertical aperature for mounting said insulation piercing tap within said connector body and for drawing said tap into electrical contact with said cable.

4,547,034

DEVICE FOR CONNECTING INSULATED WIRES TO TWIN-TERMINAL CONTACT ELEMENTS

Horst Forberg, and Bernd Delakowitz, both of Berlin, Fed. Rep. of Germany, assignors to Krone GmbH, Berlin, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 235,432, Feb. 17, 1981, abandoned. This application Jun. 6, 1983, Ser. No. 501,129
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1980, 3021798
Int. Cl.[4] H01R 9/08
U.S. Cl. 339—97 P 7 Claims



1. A terminal element for connecting to insulated wires, said terminal element comprising:

a V-shaped member formed of resilient electrical contact material, each side of said V-shaped member being shaped and configured with a slot opening into one edge thereof, said slot being defined by closely spaced sharp edges;

an entry opening in each side of said V-shaped member, said opening communicating with said slot and having a width greater than the width of said slot, said slot having a width narrower than the thickness of the conductor portion of a wire to which said terminal element is adapted to connect;

said sides of said V-shaped member being oriented at an angle of 45° with respect to the axis of the wire so that the confronting edges of said slot torque with respect to each other upon forced entry of the wire into said slot, whereby the sharp edges of said slot cut through the insulation of the wire to establish electrical connection between the conductor portion of the wire and said terminal member, the torque on one side of said V-shaped member being in the opposite direction to the torque on the opposite side when two of said wires are inserted into said member;

adjacent ones of said V-shaped members being adapted to be longitudinally mounted to an electrically insulated terminal strip in at least one row, the apex of each V-shaped terminal element being oriented in opposite directions for each two adjacent terminal elements so that the more closely adjacent V-shaped member sides are arranged in spaced confronting parallel relationship;

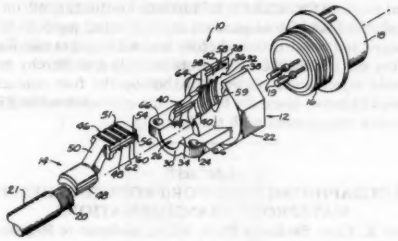
each said V-shaped member being adapted to receive two of said insulated wires, one in each slot in each side of said member.

4,547,035

ELECTRICAL CONNECTOR ENDBELL

Hermenegildo A. Espiritu, Cerritos, Calif., assignor to International Telephone & Telegraph Corp., New York, N.Y.

Filed Jan. 14, 1983, Ser. No. 457,849
Int. Cl.[4] H01R 13/58
U.S. Cl. 339—103 M 13 Claims



1. An endbell especially adapted for threading onto a connector shell which may contain contacts connected to the conductors of a cable comprising:

an endbell housing comprising a tubular wall defining a bore adapted to receive said cable;

a longitudinally extending slot in said wall of said housing dimensioned to allow said cable to be pushed laterally through said slot into said bore;

removable cover means for closing said slot after the cable is located in said bore;

tongue and groove means on said housing and said cover means for interlocking said housing and cover means; and

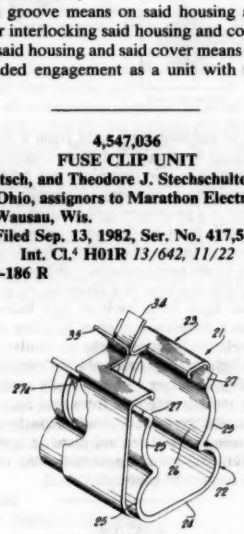
one end of said housing and said cover means being threaded for threaded engagement as a unit with said connector shell.

4,547,036

FUSE CLIP UNIT

Josef Keglewitsch, and Theodore J. Stechschulte, both of Bowling Green, Ohio, assignors to Marathon Electric Manufacturing Corp., Wausau, Wis.

Filed Sep. 13, 1982, Ser. No. 417,588
Int. Cl.[4] H01R 13/642, 11/22
U.S. Cl. 339—186 R 12 Claims



1. A multiple component metal fuse clip unit for a cartridge fuse and rejecting all fuse contacts except a tubular fuse contact with an end projection nib of a diameter less than the diameter of said contact, a generally U-shaped fuse clip having spaced resilient contact arms having a curved upper portion for receiving and gripping a tubular fuse contact with such arms having an upper inwardly projecting portion defining a fuse entrance end and having endwise stop portions defining endwise stops to locate the fuse contact endwise in the clip, a reject cover means including resilient arms extending along the opposite sides of the fuse clip arms and having inwardly ex-

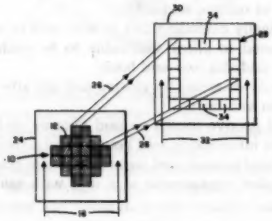
tended reject walls located over the entrance end of the fuse clip, said reject walls being aligned with the contact portion of the clip arms and a release portion coupled to said walls located longitudinally outwardly of the fuse clip arms, said reject walls projecting over the contact clip toward each other and being spaced therefrom to define an insertion gap substantially less than the diameter of a fuse contact adapted to be inserted into the fuse clip, said release portion including outwardly flared portions for receiving said reduced projecting nib on the end of a fuse, said flared portions and said reject portions being arranged and constructed whereby said nib engages said flared portion and deflect the reject arms laterally and thereby moving said reject walls outwardly whereby the fuse contact is allowed to move inwardly between the contact arms and into operative engagement with the fuse clip.

4,547,037

HOLOGRAPHIC METHOD FOR PRODUCING DESIRED WAVEFRONT TRANSFORMATIONS

Steven K. Case, St. Louis Park, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Oct. 16, 1980, Ser. No. 197,481
Int. Cl.⁴ G03H *1/26, 1/20*
U.S. Cl. 350—3.75 **19 Claims**



1. A method of redistributing light from a first plane to a second plane spaced from said first plane comprising the steps of: fixedly positioning in said first plane one holographic optical element containing a plurality of closely adjacent facets spatially arranged in a predetermined relationship with respect to each other, each facet having an interference grating for receiving a portion of input light having a first intensity pattern and each of said facets simultaneously diffracting that portion of said input light it receives in a direction so as to cause the diffracted output light from each of said facets to simultaneously arrive at a difference relative locating in said second plane from the relative location of the particular facet producing said output light and to cause the diffracted output light from said plurality of facets to be spatially redistributed in a second intensity pattern differing from said first and intensity pattern and to collectively and simultaneously impinge on a desired area residing in said second plane in a predetermined relationship differing from the predetermined relationship of said facets with respect to each other.

4,547,038

APPARATUS FOR SCANNING A PLANE WITH LIGHT BEAMS

Masafumi Mori, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

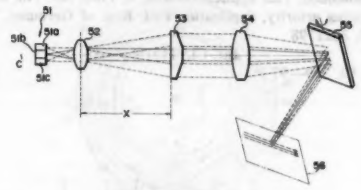
Filed Apr. 26, 1983, Ser. No. 488,807
Claims priority, application Japan, May 4, 1982, 57-73369
Int. Cl.⁴ G02B *27/17*
U.S. Cl. 350—6.5 **10 Claims**

1. An apparatus for scanning a plane with light beams, comprising:

a light source having two or more divergent light beam emitting points separated from each other and arranged on a straight line in a plane;

means for substantially collimating the divergent light beams emitted from said light emitting points of said light source;

an optical refractor having a light incidence surface and light exit surfaces equal to the number of said light beam emitting points for re-directing the substantially collimated light beams from said collimating means such that



the re-directed and substantially collimated light beams proceed along spatially separated optical paths extending in predetermined directions;

converging means for converging the light beams; and

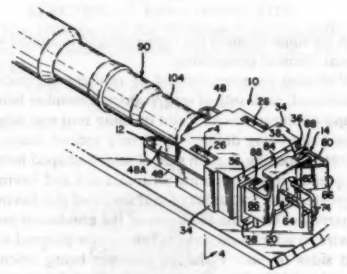
means for deflecting the light beams and scanning a surface with the convergent light beams.

4,547,039

HOUSING MOUNTABLE ON PRINTED CIRCUIT BOARD TO INTERCONNECT FIBER OPTIC CONNECTORS

Bernard G. Caron, and John C. Hoffer, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 16, 1982, Ser. No. 368,949
Int. Cl.⁴ G02B *5/14*
U.S. Cl. 350—96.20 **12 Claims**



1. A connector housing for interconnecting fiber optic connectors comprising:

housing means having a profiled bore extending therethrough in which ferrule members of the fiber optic connectors are to be disposed;

latching means secured in said housing means defining spring member means extending outwardly from one end of said housing means including curved-back sections that extend toward an entrance to said profiled bore, inwardly-directed ends of said curved-back sections being positioned adjacent said entrance so that when a ferrule member of a fiber optic connector is to be positioned in said profiled bore, the ferrule member engages said curved-back sections camming them away from each other enabling the ferrule member to be seated in said profiled bore and said inwardly-directed ends engage a shoulder of the ferrule member thereby latchably maintaining the ferrule member in said profiled bore.

4,547,040
OPTICAL FIBER ASSEMBLY AND PROCESS FOR PREPARING SAME

Takashi Yamamoto, Hiroshima, and Kenichi Sakunaga, Otake, both of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Jun. 21, 1983, Ser. No. 506,411
Int. Cl.⁴ D02G *3/00*; B29D *11/00*
U.S. Cl. 350—96.34 **21 Claims**

1. An optical fiber assembly comprising at least two plastic optical fibers and an embedding material, said plastic optical fibers being arranged substantially in parallel to each other and embedded in said embedding material, wherein each plastic optical fiber comprises a core of polymer having a refractive index, n_1, and a cladding of a polymer having a refractive index, n_2, wherein the refractive indices n_1 and n_2 satisfy the following relationship [I]

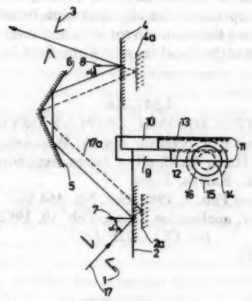
$$n_1 - n_2 > 0.01 \quad [I],$$

and wherein said embedding material comprises a polymer having a refractive index n_3.

4,547,041
ARRANGEMENT FOR OPTICAL PATH LENGTH VARIATION

Johannes Grosser, 2, Ziegelmühlenweg, 69 Jena, District of Gera, German Democratic Rep.

Filed Oct. 16, 1981, Ser. No. 312,193
Claims priority, application German Democratic Rep., Dec. 1, 1980, 225597
Int. Cl.⁴ G02B *5/08, 5/10*
U.S. Cl. 350—622 **3 Claims**

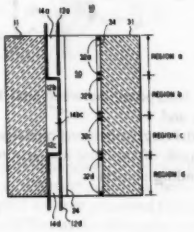


1. Reflection system for optical path length variation comprising in an optical path of beams in optical alignment,
an entrance reflector,
beam deflecting optical elements,
an exit reflector,
said beam deflecting elements being arranged between said entrance reflector and said exit reflector, the plane of incidence of said entrance reflector and the respective plane of said exit reflector being coincident, the normal upon said entrance reflector and the normal upon said exit reflector being parallel and unidirectional,
a first slide means for supporting said entrance reflector,
a second slide means for supporting said exit reflector,
and gear means for simultaneously displacing said first slide means and said second slide means about different amounts to obtain said path length variation.

4,547,042
LIQUID CRYSTAL DISPLAY WITH ELECTRODE SHIELDING ANOTHER ELECTRODE

Peter D. T. Ngo, Colts Neck, N.J., assignor to AT&T Information Systems Inc., Holmdel, N.J.

Filed Aug. 5, 1983, Ser. No. 520,695
Int. Cl.⁴ G02F *1/133*
U.S. Cl. 350—334 **14 Claims**



7. A display device including
a first substrate,
a body of display material adjacent to said first substrate, said display device having first and second regions each of which includes a portion of said substrate and of said display material,
a first set of conductors disposed adjacent to said first substrate in said first region, and
a second set of conductors disposed adjacent to said substrate in said first and second regions, said first and second sets of conductors being disposed with respect to one another such that at least a portion of each first set conductor electrically shields from said display material that portion of a respective second set conductor that is in said first region, at least said portion of said each first set conductor being a predetermined distance from said first substrate and the portion of said respective second set conductor that is in said second region being substantially said predetermined distance from said first substrate.

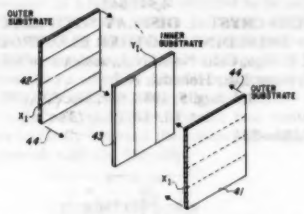
4,547,043
STACKED LCD GRAPHICS DISPLAY

Perry A. Penz, 2203 Eastwood Dr., Richardson, Tex. 75080

Continuation-in-part of Ser. No. 172,108, Jul. 25, 1980, Pat. No. 4,364,039. This application Jan. 22, 1982, Ser. No. 341,976
The portion of the term of this patent subsequent to Dec. 14, 1999, has been disclaimed.
Int. Cl.⁴ G02F *1/13*
U.S. Cl. 350—335 **10 Claims**

1. A graphics display comprising:
a first LCD matrix, comprising a planar area of liquid crystal material; a plurality of parallel data lines, and a plurality of parallel scan lines, said scan lines being orthogonal to said data lines, and said plurality of scan lines and said plurality of data lines being on opposite sides of said planar area of liquid crystal material, said data lines and said scan lines defining a plurality of liquid crystal pixels respectively interposed between a respective one of said scan lines and a respective one of said data lines;
a second LCD matrix, comprising a planar area of liquid crystal material, a plurality of parallel data lines, and a plurality of parallel scan lines, said scan lines being orthogonal to said data lines, and said plurality of scan lines and said plurality of data lines being on opposite sides of

said planar area of liquid crystal material, said data lines and said scan lines defining a plurality of liquid crystal pixels respectively interposed between a respective one of said scan lines and a respective one of said data lines, said first and second LCD matrices being optically aligned;



a polarizer interposed between said first and second LCD matrices; and

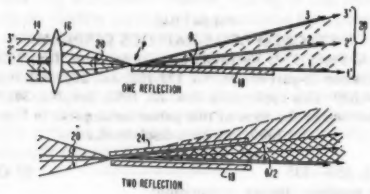
means for driving respective correspondingly aligned ones of said pixels of said first and second LCD matrices with corresponding signals.

4,547,044

BEAM-FOLDING WEDGE TUNNEL

Kantilal Jain, and Milton R. Latta, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1983, Ser. No. 481,011
Int. Cl.⁴ G02B *3/06*
U.S. Cl. 350—433 **6 Claims**



1. An apparatus for making uniform the intensity distribution across a light beam that is directed along a predetermined path comprising

first beam folding optical means including

first optical means to focus said beam into a first line at a point along said predetermined path, and

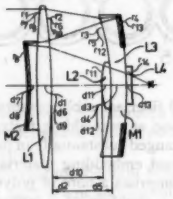
first reflecting optical means positioned along said path near said point to intercept part of the beam so as to permit a portion of the beam to be transmitted along said path and to cause another portion of the beam to be reflected back into the transmitted portion to make the intensity distribution across the light beam uniform.

4,547,045

HIGH SPEED CATADIOPTRIC OBJECTIVE LENS SYSTEM

Ludvik Canzek, Quellmattstrasse 3, 5035 Unterentfelden, Switzerland

Continuation-in-part of Ser. No. 308,798, Oct. 5, 1981, Pat. No. 4,456,343. This application Mar. 9, 1984, Ser. No. 588,808
Claims priority, application Switzerland, Oct. 17, 1980, 7753/80
The portion of the term of this patent subsequent to Jun. 26, 2001, has been disclaimed.
Int. Cl.⁴ G02B *17/08*
U.S. Cl. 350—444 **9 Claims**



1. A catadioptric lens system comprising in the order of the transmission of a regular light ray:

a first single lens;

a main mirror lens;

a counter mirror located on the object side in front of the first single lens, and

a field lens system, wherein the catadioptric lens system satisfies the following conditions:

(1) $d_{CM}>0$

(2) $f_1 \geqq 1.5f$

(3) $0.14f \leqq d_2 \leqq 0.53f$

(4) $f_{FL}>0$,

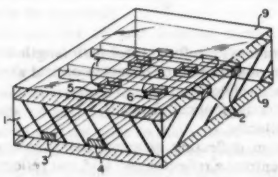
wherein reference symbol d_{CM} represents the distance between the reflecting face of the counter mirror and the front face of the first single lens, d_{CM} being positive, as the counter mirror is on the object side in front of the first single lens, reference symbol f_1 represents the focal length of the first single lens, reference symbol f represents the focal length of the catadioptric lens system, reference symbol d_2 represents the air separation between the first single lens and the main mirror lens, and reference symbol f_{FL} represents the focal length of the field lens system.

4,547,046

ELECTROCHROMIC DISPLAY DEVICE

Hiromochi Muramatsu, Nagoya; Atsushi Watanabe, Toyokawa, and Kunihiko Hara, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 8, 1983, Ser. No. 464,862
Claims priority, application Japan, Feb. 10, 1982, 57-20164
Int. Cl.⁴ G02F *1/23*
U.S. Cl. 350—357 **7 Claims**



1. An electrochromic display device having two principal sides and comprising:

a plurality of mutually parallel strip-shaped display electrodes,

a plurality of mutually parallel strip-shaped opposite electrodes,

said display electrodes and said opposite electrodes arranged so as to be in prallel planes, respectively, and wherein the strips of said strip-shaped display electrodes and of said strip-shaped opposite electrodes are inclined to one another,

electrochemcially-color-developing solid layers and solid electrolyte layers as intermediate layers, both said types of layers laminated by the areas formed by the intersection between the display electrodes and opposite electrodes, and

an electrically insulating material occupying all portions inside the device other than those occupied by said strip-shaped display electrodes, said strip-shaped opposite electrodes, said electrochemically-color-developing layers and said electrolyte layers.

4,547,047

MICROSCOPE TUBE SYSTEM

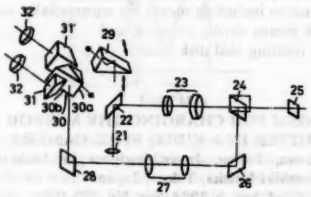
Takaharu Koike, Ina, and Akio Taira, Hachiouji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 24, 1982, Ser. No. 361,254

Claims priority, application Japan, Mar. 25, 1981, 56-42399

Int. Cl.⁴ G02B *21/20*

U.S. Cl. 350—514 **3 Claims**



1. A microscope optical system, comprising:

an objective lens;

a first reflecting means capable of being inserted into a light path to bend toward an eyepiece the light from an object which has passed through said objective lens;

a Jentzch type binocular prism consisting of a beam splitter having a side surface to receive the light bent toward said eyepiece by said first reflecting means and also having a front surface and a pair of prism members respectively arranged adjacent to said beam splitter and capable of reflecting the light divided by said beam splitter to lead said divided light to said eyepiece and arranged between said first reflecting means inserted into the light path and said eyepiece;

a second reflecting means capable of being inserted into the light path in place of said first reflecting means to bend in the substantially horizontal direction the light from the object which has passed through said objective lens;

a plurality of reflectors arranged in a substantially horizontal plane to cause to enter into said beam splitter, through a side surface thereof, said light bent in the substantially horizontal direction to lead said light bent in the substantially horizontal direction to said eyepiece;

a quick-return mirror being one of said reflectors and arranged so as to be able to be moved out of the light path to cause to enter onto an image-taking means said light bent in the substantially horizontal direction; and

a relay lens system arranged between said beam splitter and one of said reflectors,

said first reflecting means being inserted into the light path when an observation is to be effected, and said second reflecting means being inserted into the light path in place of said first reflecting means when a photographing is to be effected.

4,547,048

SPECTACLE FRAME FOR MULTIFOCAL LENSES

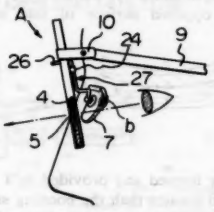
Tohru Negishi, 264-2, Bonsai-cho, Ohmiya-shi, Saitama-ken, Japan

Continuation of Ser. No. 355,208, Mar. 5, 1982, abandoned. This application Jun. 26, 1984, Ser. No. 624,793

Claims priority, application Japan, Apr. 17, 1981, 56-59000; Aug. 11, 1981, 56-124803

Int. Cl.⁴ G02C *1/00, 5/20, 5/14*

U.S. Cl. 351—137 **14 Claims**



1. In a frame for spectacles especially useful for lenses with different focal lengths at different positions therein, comprising a pair of lens rims adapted to have mounted therein leftside and rightside lenses having different focal lengths at different positions therein, a bridge means for connecting between said lens rims, a nosepad means for supporting the inner side of each of said lens rims against the sides of the nose, and a side piece attached to the outer side of each of said lens rims, the improvement comprising:

a hinge means attaching each side piece to the outer side of said rim for permitting said side piece to be tilted upward and downard relative to said rim, said hinge means including limiting means for limiting the angle to which said side pieces can be tilted relative to said rim to a prescribed angle;

a level adjusting means attaching said nosepad means to the inner side of each of said lens rims and for moving the nosepad means vertically between limit positions corresponding to the respective angles to which said sidepieces can be tilted to change the relative height of said lens rims with respect to the normal line of vision;

one limit position of the level adjusting means and the corresponding prescribed angle of the side pieces orienting the rims to positions such that portion of lenses with one focal length which have been mounted in said rims lie in a preferred line of vision therefor; and

a second limit position of the level adjusting means and the corresponding prescribed angle of the side pieces orienting the rims to a position such that portion of lenses with a different focal length which have been mounted in said rims lie in a preferred line of vision therefor;

whereby the tilting of the side pieces and the vertical moving of the nosepad means to the corresponding positions causes the respective different focal length portions of lenses in the rims to lie in preferred lines of vision for the respective different focal length portions of the lenses.

4,547,049

COMPOSITE OPHTHALMIC LENS SYSTEM

Robert L. Cotie, Dallas, Tex., assignor to C & H Contact Lens Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 241,570, Mar. 9, 1981, abandoned. This application Sep. 1, 1983, Ser. No. 528,606

Int. Cl.⁴ G02C *7/02, 7/06, 7/08*

U.S. Cl. 351—159 **17 Claims**

1. Apparatus for ophthalmic use in treating bi-optical deficiencies of the eye in accordance with a prescription correction, said apparatus comprising:

a first structural lens of pre-determined optical prescription

and surface curvature for treating a first ophthalmic eye deficiency;

a second additive lens of pre-determined radial difference affording a select optical prescription when applied to said structural lens and formed of thin, pliable light transmitting plastic material of sufficiently thin, cross-sectional area to afford pliability for flexibly conforming to said bonding surface curvature of said structural lens and having first and second opposed surfaces for treating a second ophthalmic eye deficiency;

said first opposed surface of said additive lens being

smoothly formed and provided in a curvature different from and greater than the bonding surface curvature of said structural lens and bonded in flexible conforming relationship to said structural lens; and

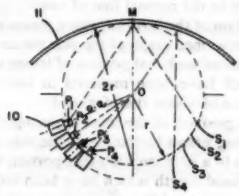
said second opposed surface of said additive lens being formed with a continuous, smoothly formed surface configuration comprising a single light refractive element having refractive properties which differ from and complement those of said first spectacle lens for bi-optical refraction of the light rays transmitted by said bonded first and second lenses to said eye in accordance with said prescription correction.

4,547,050

STEREOSCOPIC PICTURES BY ROTATING PROJECTORS

Robert B. Collender, 709 Patterson Ave., Glendale, Calif. 91203

Filed Aug. 18, 1983, Ser. No. 524,747
Int. Cl.⁴ G03B *21/32, 35/00*
U.S. Cl. 352—43 **15 Claims**



1. A method of recording and reproducing stereoscopic viewing for observation by observers without visual aids at the eyes of the observers, comprising:

a. capturing several views from different lateral points;

b. placing the several views obtained in several projection systems arranged around the periphery of a rotating multiple projection device;

c. relating a given view to a given projection system;

d. projecting a plurality of the given views simultaneously onto a screen from the periphery of said rotating projection device; and

e. causing said screen to reflect light horizontally and scatter light vertically to provide a vertical aerial exit slit for each projection system between the observers and said screen;

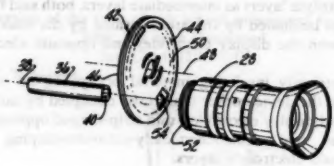
whereby simultaneous viewing by an observer of several aerial exit slits in a given interval of time generates stereoscopic pictures for said observer.

4,547,051

SHUTTER FOR A VIDEO TAPE CAMERA

Steven L. Swinehart, Albuquerque, N. Mex., assignor to Nisus Video Incorporated, Albuquerque, N. Mex.

Filed Dec. 16, 1983, Ser. No. 562,233
Int. Cl.⁴ G03B *9/10*
U.S. Cl. 352—216 **39 Claims**



1. A focal plane shutter for a video camera having a lense and pickup comprising:

disk means positioned between said lense and said pickup for rotation about an axis to define an annular locus in registration with said pickup;

said disk means having a single light admitting aperture intersecting said locus;

said disk means, except for said aperture, being opaque to the passage of light between said lense and said pickup;

said disk means including means for substantially balancing said disk means during rotation; and

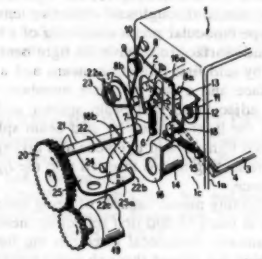
means for rotating said disk means.

4,547,052

MECHANISM FOR CHARGING THE MIRROR AND SHUTTER IN A VIDEO STILL CAMERA

Tahei Morisawa, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1984, Ser. No. 597,109
Claims priority, application Japan, Apr. 30, 1983, 58-77158
Int. Cl.⁴ G03B *19/12*
U.S. Cl. 354—152 **6 Claims**



1. A mechanism for charging a mirror and a shutter in a video still camera comprising:

(a) a charging means

(b) a final speed reducing gear drivable by the charging means;

(c) a driving pin mounted eccentrically on said final speed reducing gear;

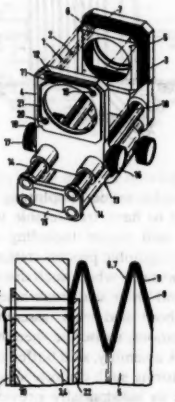
(d) a mirror charging lever actuatable by said driving pin for charging the mirror during an initial period of a single revolution of said final speed reducing gear; and

(e) a shutter charging lever actuatable by said driving pin for charging the shutter while the mirror is being charged by said mirror charging lever, such that the mirror is completely charged prior to completion of the charging of the shutter.

4,547,053
BELLOWS ASSEMBLY FOR PHOTOGRAPHIC CAMERAS

Werner Tobler, Aitrach, Fed. Rep. of Germany, assignor to Firma Novoflex Fotogeräitebau Karl Müller, Memmingen, Fed. Rep. of Germany

Filed Apr. 27, 1983, Ser. No. 489,212
Claims priority, application Fed. Rep. of Germany, May 8, 1982, 3217412
Int. Cl.[4] G03B 7/08, 17/04
U.S. Cl. 354—187 6 Claims

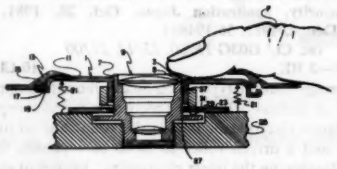


1. In a bellows assembly for photographic cameras comprising a frame mounting and guiding spaced front and rear uprights, a bellows with inner and out surface connected between said uprights, and means for adjusting the spacing between the uprights to expand or contract the bellows, the improvement in which the bellows incorporates thin electrical leads running between the inner and outer surfaces of the bellows and foldable with the body of the bellows, said leads providing electrical connections between said uprights.

4,547,054
FINGER OVER THE LENS DETECTING APPARATUS

Mark E. Bridges, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 3, 1984, Ser. No. 576,683
Int. Cl.[4] G03B 17/38
U.S. Cl. 354—268 6 Claims



1. Apparatus in a photographic camera for detecting that a camera user's finger may be in the optical path of a taking lens, said apparatus comprising:

finger pressure sensitive means extending at least partially around the optical path of said lens for undergoing various changes of position in response to finger pressure at respective locations around the optical path;

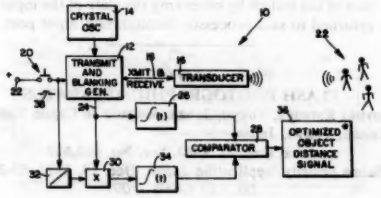
means for sensing each of the changes of position of said finger pressure sensitive means; and

means connected to said sensing means for alerting the camera user that a finger may be in the optical path of said lens, whenever said sensing means senses any one of the changes of position of said finger pressure sensitive means.

4,547,055
METHOD AND APPARATUS FOR OPTIMIZING OBJECT DISTANCE SIGNALS

George Ehrenfried, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 26, 1984, Ser. No. 686,474
Int. Cl.[4] G03B 3/00; G01S 15/88
U.S. Cl. 354—401 6 Claims



1. Apparatus for focusing an optimized image of a plurality of different subjects located at substantially different subject distances, comprising:

means for deriving a signal representative of the distance to the nearest subject included within said plurality of different distance subjects;

means for deriving a composite signal representative of the relative size of each of said subjects and their respective subject distances;

means for generating a signal representative of the ratio between said nearest and said composite subject distance signals;

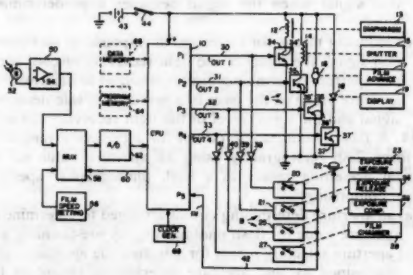
an image plane; and

an adjustable focus lens system responsive to said ratio signal for focusing an optimized image of said plurality of different subjects at said image plane.

4,547,056
DIGITAL CIRCUIT WITH IMPROVED INPUT/OUTPUT CONNECTIONS

Hans-Peter Baumeister, Churchville, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 15, 1984, Ser. No. 671,396
Int. Cl.[4] G03B 17/00; H04B 12/00
U.S. Cl. 354—412 10 Claims



1. A circuit for operating an electrical device and for receiving a signal from a switch whenever it is actuated, the switch being of the type that interrupts circuit continuity between two terminals, said circuit comprising:

a processor having an output port for sending an output signal and an input port for receiving an input signal;

means for connecting the electrical device to said output port;

means for connecting one terminal of the switch to said output port and the other terminal of the switch to said input port;

means connected to said output port for generating a stream of interrogating pulses for determining the status of the switch, said pulses being of such duration as not to cause a noticeable change in the operation of the electrical device; and

means connected to said input port for detecting the actuation of the switch by observing the state of the input signal returned to said processor through said input port.

4,547,057

FLASH PHOTOGRAPHIC APPARATUS

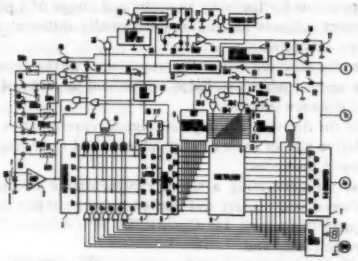
Hiroyuki Kataoka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1983, Ser. No. 565,617

Claims priority, application Japan, Dec. 29, 1982, 57-231512

Int. Cl.[4] G03B 7/097

U.S. Cl. 354—415 **21 Claims**



1. A photographic apparatus usable in a flash photographic system of a kind which performs pre-flashing before flash photography, receives a reflection light from an object to be photographed as a result of pre-flashing and determines a flash photographic aperture value on the basis of the quantity of the reflection light received, comprising:

(a) a light receiving circuit having a light sensitive element, said light receiving circuit forming a signal corresponding to the light quantity received by the light sensitive element;

(b) a detection signal forming circuit arranged to detect the signal of the light receiving circuit and to produce a detection signal when the signal becomes a predetermined level;

(c) reducing means for lowering, in response to said detection signal, the signal of the light receiving circuit; and

(d) an aperture determining circuit arranged to determine an aperture value on the basis of a presence of said detection signal and the signal level of the light receiving circuit.

14. A flash photographic circuit for a camera arranged to perform flash photography using an aperture value set by manual presetting means as a flash photographic aperture value, comprising:

(a) an aperture determining circuit arranged to determine an aperture value for flash photography by pre-flashing; and

(b) aperture selecting means for selecting the aperture value determined by said aperture determining circuit as the flash photographic aperture value in place of the manually preset aperture value when the aperture value determined by said aperture determining circuit represents an aperture value closer to a fully open aperture value than a manually preset aperture value.

4,547,058

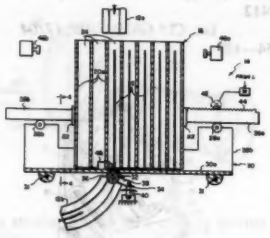
SHEET FILM BUFFER STATION

Robert M. Peffer, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 27, 1983, Ser. No. 565,935

Int. Cl.[4] G03G 15/00

U.S. Cl. 355—3 SH **7 Claims**



1. In an electrographic copier employing a plurality of discrete sheets adapted to have transferable images formed respectively thereon, said copier including a track assembly associated with electrographic process stations and having first and second remote portions where such discrete sheets respectively egress from and enter said track assembly, such sheets being transported about said track assembly into operative relation with such stations, a discrete sheet buffer station associated with said track assembly, said buffer station comprising:

means for safely storing such discrete sheets, in spaced relation, and so as to substantially prevent contact of the respective surfaces of such sheets;

means for indexing said storing means relative to said track assembly to align said storing means with said track assembly at a location adapted to selectively receive a sheet egressing from said first portion of said track assembly, and distribute a sheet to enter said second portion of said track assembly; and

means operatively associated with said storing means for selectively releasing a stored sheet for distribution into said second portion of said track assembly.

4,547,059

IMAGE-TRANSFER-TYPE ELECTROSTATIC RECORDING APPARATUS

Haruhiko Nagayama, Machida, and Satoru Tomita, Kawasaki, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 26, 1982, Ser. No. 436,796

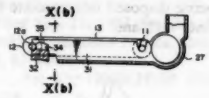
Claims priority, application Japan, Oct. 28, 1981, 56-161706[U]; Dec. 4, 1981, 56-194484

Int. Cl.[4] G03G 15/00, 15/14, 21/00

U.S. Cl. 355—3 BE **10 Claims**

1. In an image-transfer-type electrostatic recording apparatus in which an endless-belt-shaped recording medium capable of forming latent electrostatic images thereon is trained over a drive roller and a driven roller so as to be rotatable thereabout for developing the latent electrostatic images to visible images and transferring the developed visible images to a recording sheet; said drive and driven rollers being supported by a frame member; and comprising a device for correcting the skewing of said endless-belt-shaped recording medium by vertically moving one end portion of said driven roller, the improvement wherein one end portion of said driven roller is supported by said frame member at one end portion thereof so as to be movable within a predetermined range for correcting the skewing of said recording medium, and there is disposed a recording sheet guide means comprising a sheet guide member along which said recording sheet is guided onto a predeter-

mined image transfer section on the surface of said recording medium, which sheet guide member is supported by said frame



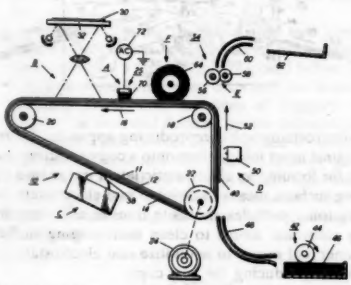
member, said sheet guide member moving in response to vertical movement of said driven roller.

4,547,060

CHARGING APPARATUS

Nero R. Lindblad, Palmyra, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 1, 1983, Ser. No. 556,825
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R **4 Claims**



2. Apparatus for forming images on a charge retentive surface, said apparatus comprising:

means for moving said charge-retentive surface in a first direction;

an electrically conductive brush supported for contact with said charge-retentive surface;

means for electrically biasing said conductive brush to a voltage which is applied at a frequency suitable for forming a periodic line pattern on said charge-retentive surface;

means for vibrating said brush in a second direction which is substantially perpendicular to said first direction;

means for exposing said line pattern to an image to be reproduced to thereby form a latent electrostatic image on said surface and

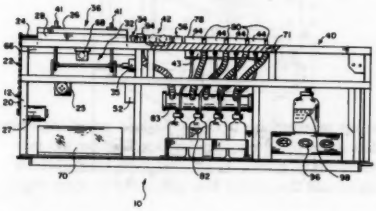
means for applying uncharged toner to said surface.

4,547,061

ELECTROPHOTOGRAPHIC IMAGING APPARATUS AND METHOD PARTICULARLY FOR COLOR PROOFING

Harold J. Weber, Middlesex, Mass.; Manfred R. Kuehnle, Merrimac, N.H.; James C. Compton, Middlesex, Mass.; John N. Poulakis, Middlesex, Mass.; Michael J. Szymanski, Middlesex, Mass.; Kenneth A. Lindblom, Worcester, Mass., and Donald S. Cleveland, Essex, Mass., assignors to Coulter Systems Corporation, Bedford, Mass.

Filed Feb. 16, 1982, Ser. No. 348,769
Int. Cl.[4] G03G *13/10, 15/10*
U.S. Cl. 355—10 **44 Claims**



1. In an electrophotographic imaging apparatus for producing a print copy of a pattern carried by a transparency in which the apparatus includes a supporting framework defining an internal area and means cooperating with said framework defining a light-tight housing, a platen assembly, the platen assembly having an electrophotographic member receiving surface and constructed and arranged for translatory movement lengthwise along said framework in a predetermined linear path substantially the entire length of said housing past a plurality of stations including a charging station, an imaging station, a toning station and a transfer station arranged sequentially within the housing and along said path, means for securing an electrophotographic member on said surface of the platen assembly, the electrophotographic member including a photoconductive surface and secured to the platen assembly, said platen assembly adapted to be positioned at the imaging station with the photoconductive surface facing inwardly toward the housing, the charging station being adjacent the imaging station and including corona generating means for applying the charge potential to the photoconductive surface, the imaging station including a copyboard having means for mounting the transparency thereon facing toward the photoconductive surface, means for establishing engagement between the transparency and the electrophotographic member subsequent to charging of said photoconductive surface, a source of radiant energy and means for projecting radiant energy through the transparency subsequent to application of a charge potential to the photoconductive surface such that exposure of the charged surface to the radiant energy will produce a latent electrostatic image of the pattern on the exposed photoconductive surface, the toning station including means for depositing liquid toner on the photoconductive surface for rendering the latent electrostatic image visible, the transfer station including means for transferring the toned image to the transfer member, means for sequentially translating the platen assembly along said linear path between stations, the improvement comprising cooperating registration means provided at both the imaging and transfer stations to achieve required registration between the transparency and electrophotographic member at the imaging station and between the electrophotographic member and transfer member at the transfer station independently of the relationship of the functional elements at such stations relative to the framework, cooperating guide means on the framework and platen assembly defining the path of movement of said platen assembly from station to station with the photocoductive surface facing inwardly toward each station during such movement and means on the

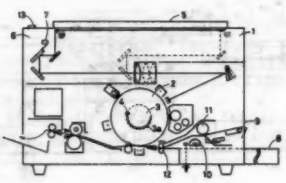
toning module to render the definition of the toning gap independent of the relationship of the platen assembly or the toning module to the said framework.

4,547,062

COPY PAPER SUPPLY TIMING CONTROL IN A COPYING MACHINE

Katsuyoshi Fujiwara, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 23, 1983, Ser. No. 506,973
Claims priority, application Japan, Jun. 25, 1982, 57-110517
Int. Cl.⁴ G03G *15/00, 21/00*
U.S. Cl. 355—14 R **2 Claims**



1. A copy paper supply timing control system for a copying machine comprising:

a slit plate secured to a shaft of a photosensitive drum of the machine, said slit plate having a plurality of slits formed with a predetermined distance therebetween;

detection means for detecting said slits formed in said slit plate and for developing a slit detection pulse of a period (t') when said slit plate rotates;

optical system start detecting means for developing an optical system start signal when an optical system of the machine starts its movement;

memory means for memorizing a desired delay time from the development of said optical system start signal to a supply timing of a copy paper, said memory means including;

a first memory for memorizing a desired number (N) of the slit detection pulses; and

a second memory for memorizing a desired time (T) from the development of the N-th slit detection pulse to the supply timing of the copy paper; and

control means for developing a control signal for performing the copy paper supply when said desired delay time equalling N·t'+T has passed after the development of said optical system start signal, said control means comprising:

a timer for counting a time period (t) from the development of said optical system start signal to the development of a first slit detection pulse; and

compensation means for modifying said desired number (N) stored in said first memory and said desired time (T) stored in said second memory in accordance with said time period (t) counted by said timer.

4,547,063

MOVING MAGNET CLEANER

Klaus K. Stange, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

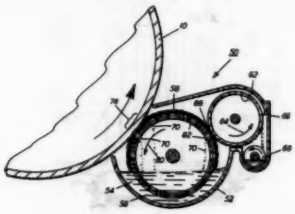
Filed Jul. 25, 1983, Ser. No. 516,628
Int. Cl.⁴ G03G *15/08*
U.S. Cl. 355—15 **7 Claims**

1. In a reproduction machine having a photoreceptor, means for developing a latent electrostatic image on the photoreceptor to produce a developed image, means for transferring the developed image from the photoreceptor to a transfer member, and a cleaning apparatus for removing residual toner from the photoreceptor, the cleaning apparatus disposed adjacent the photoreceptor and comprising:

a magnetic cleaner roll disposed adjacent to the photoreceptor and having a plurality of carrier bristles,

a carrier housing including a carrier sump provided with a supply of carrier material, the magnetic cleaner roll positioned for rotation within a portion of the carrier sump,

a toner roll disposed near the magnetic cleaner roll for scavenging toner from the carrier bristles, the magnetic cleaner roll being disposed intermediate the photoreceptor and the toner roll, and



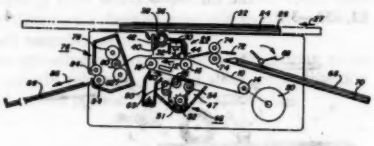
self-leveling means comprising a pre-determined distance between the surfaces of the toner roll and the cleaner roll, portions of the carrier bristles in excess of the distance between the surfaces of the toner and cleaner rolls being scraped from said bristles, said self-leveling means leveling the carrier bristles to said pre-determined size.

4,547,064

ELECTROSTATOGRAPHIC REPRODUCING APPARATUS

Herbert H. Ammenheuser, Henrietta, and Joseph Fantuzzo, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 31, 1984, Ser. No. 645,961
Int. Cl.⁴ G03G *21/00*
U.S. Cl. 355—15 **14 Claims**



1. An electrostatographic reproducing apparatus for reproducing original input information onto a copy substrate including means for forming an electrostatic latent image on a cyclable imaging surface, means to develop said electrostatic latent image with toner particles, means to transfer said toner image to a copy substrate, means to clean said imaging surface of residual toner and means to neutralize said electrostatic latent image prior to producing the next copy;

said development and cleaning means comprising a modular housing assembly positioned for both development and cleaning engagement with said imaging surface, said modular assembly including development means in continuous developing engagement with said imaging surface, and a cleaning blade for cleaning said imaging surface, and including means to alternately position said cleaning blade into and out of cleaning engagement with said imaging surface, said development and cleaning housing further including a used toner collection enclosure to collect used toner cleaned from the imaging surface by the cleaning blade when said blade is in engagement with said imaging surface, said toner collection enclosure being separate from the development portion of said housing whereby said development and cleaning operations are performed on said imaging surface at different times and said cleaned toner is collected separately from the development supply of toner.

4,547,065

DEVICE FOR SIMULTANEOUSLY PRINTING AND DEVELOPING PHOTOGRAPHS

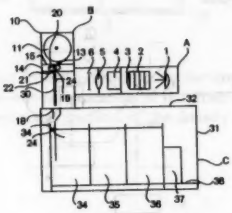
Claude Thebault, Meylan, France, assignor to KIS France, Grenoble, France

Filed Sep. 27, 1983, Ser. No. 536,399

Claims priority, application France, Oct. 5, 1982, 82 16841; Mar. 18, 1983, 83 04698

Int. Cl.[4] G03B *27/80, 27/52*

U.S. Cl. 355—28 **3 Claims**



1. An improved integrated automatic device for simultaneously printing and developing photographs, comprising:

(a) an exposure unit comprising a lamp, a filtering assembly, and an optical assembly formed by a frame and a lens, the exposure unit issuing a light beam;

(b) a dark room unit comprising:

(i) a light proof cartridge containing light sensitive photographic paper and a first slot for feeding said paper from said cartridge;

(ii) a box on the top of which said cartridge rests;

(iii) a delivering member for delivering a predetermined length of said paper, the delivering member having two disengageable parallel delivery rollers maintained under pressure, one driving, the other pressing;

(iv) a second slot in the bottom of said box just below the two rollers and substantially in line with the first slot to allow the passage of the delivered paper therethrough; and

(v) a cutter for cutting the paper after said predetermined length of paper has been delivered, said cutter having a fixed knife and a mobile knife disposed below said second slot, said fixed knife being disposed just below and substantially plumb with the plane of tangency of the two delivery rollers, and defining on the delivered light sensitive paper a part thereof to be exposed by said light beam, said mobile knife in a rest position entirely covering said second slot to seal the same in a light tight fashion;

(c) a developing unit comprising treatment vats and means adapted for advancing an exposed sheet of paper through the different vats.

4,547,066

EXPOSURE APPARATUS

Kaoru Murai, Chofu, Japan, assignor to ORC Manufacturing Co., Ltd., Chofu, Japan

Filed Feb. 23, 1983, Ser. No. 469,088

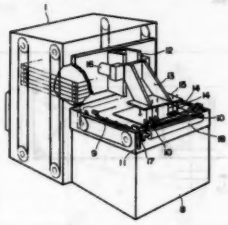
Claims priority, application Japan, Feb. 24, 1982, 57-28360

Int. Cl.[4] G03B *27/04*

U.S. Cl. 355—97 **2 Claims**

2. In an exposure apparatus comprising an exposure base having an exposure light, a top surface, and a bottom surface; a shelf structure adjacent said exposure base; palettes stacked in said shelf structure with each palette carrying at least one of a plurality of sheets, said sheets comprising masks, patterns, and unexposed film; means for moving a selected palette to a position adjacent said top surface so as to provide access to a sheet carried thereon; and means for successively transferring sheets from selected palettes onto said exposure base top surface in order to provide a stack of sheets on said top surface comprising a sheet of unexposed film, a mask, and a pattern such that portions of said unexposed film are selectively exposed, the improvement comprising:

means for building said stack by individually and successively placing said sheets at an exposure station with said unexposed film being positioned on said stack farthest from said top surface; and



said light being located adjacent said bottom surface, such that correctness of combination of said mask and pattern sheets of said stack may be examined by illuminating said light prior to providing said unexposed film to said stack.

4,547,067

APPARATUS FOR DETECTING FAULTS IN TRANSPARENT OBJECTS

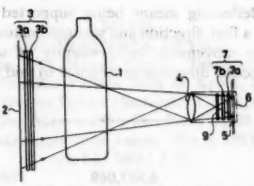
Tsukasa Watanabe, Kobe, Japan, assignor to Yamamura Glass Kabushiki Kaisha, Hyogo, Japan

Filed Dec. 13, 1983, Ser. No. 560,966

Claims priority, application Japan, Dec. 21, 1982, 57-225443

Int. Cl.[4] G01B *11/18;* G01N *21/04*

U.S. Cl. 356—239 **13 Claims**



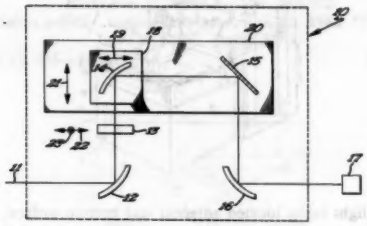
1. An apparatus for detecting faults in transparent objects which is so arranged that by projecting diffused light towards the object to be inspected, light transmitted through said object is formed into an image through a lens system so as to convert the optical image into an electric signal by a photoelectric detector provided on the image forming plane for subjecting said electric signal to a signal processing system, thereby to judge quality of said object to be inspected, said fault detecting apparatus comprising an incident side circular polarizer which includes a plane polarizing plate combined with a ¼ wave plate and is disposed between the diffused light source and the object to be inspected so as to receive the diffused light by the polarized plate directed towards a side of the light source for deriving monochromatic light corresponding to the ¼ wave plate from a side of the ¼ wave plate as circular polarized light in a predetermined turning direction, and a detecting side circular polarizer which includes a ¼ wave plate combined with a polarizing plate and is disposed between the object to be inspected and the photoelectric detector so as to receive a circular polarized light of the light transmitting through said object and in the same turning direction as the circular polarized light as the incident side, by the ¼ wave plate directed towards the side of the object to be inspected for deriving as a plane polarized light from the side of the plane polarizing plate.

4,547,068

OPTICAL ANALYTICAL INSTRUMENT BEAM CONDENSER

Joel P. Covey, 2110 Westbrook La., and D. Warren Vidrine, 4901 Chalet Gardens Rd. #209, both of Madison, Wis. 53711

Filed Mar. 4, 1983, Ser. No. 472,026
Int. Cl.[4] G01N *21/01*
U.S. Cl. 356—244 11 Claims



1. In an analytical instrument of the type having a source of analytical radiation, having means for detecting said analytical radiation and having means for supporting a sample to be analyzed, an improved beam condenser system having optical elements directing said analytical radiation along an optical path to said sample supporting means, including first means for focusing said analytical radiation relative to said sample supporting means, and from said sample supporting means to said radiation detecting means, including second means for focusing said analytical radiation relative to said radiation detecting means, said optical elements further comprising means for collimating analytical radiation focused by said first means and means for deflecting analytical radiation collimated by said collimating means to said second means, said collimating means and deflecting means being supported for common movement in a first direction and said collimating means being supported for movement, independently of said deflecting means, in a second direction orthogonal to said first direction.

4,547,069

TUBULAR CUVETTE FOR ATOMIC ABSORPTION SPECTROMETRY

Bernhard Lersmacher, Aachen, Fed. Rep. of Germany, and Wilhelmus F. Knippenberg, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 9, 1983, Ser. No. 473,518
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208744
Int. Cl.[4] G01N *21/03, 21/74*
U.S. Cl. 356—244 9 Claims

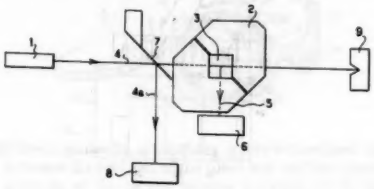
1. In a tubular cuvette for atomic absorption spectrometry comprising a tubular member having inner and outer walls and having flange-like parts disposed at least in proximity to ends of said tubular member, the improvement comprising said tubular member consisting of pyrolytic graphite, and said tubular member and flange-like parts being provided with a common envelope of pyrolytic graphite.

4,547,070

APPARATUS AND PROCESS FOR MEASURING THE COLLOIDAL STABILITY OF LIQUIDS

Manfred Moll, Flavigny sur Moselle; Daniel Bazard, Custines; Michel Niclause, Nancy; Louis-Marie Vincent, Seichamps, and Jean-Claude Andre, Nancy, all of France, assignors to Centre de Recherche et de Development, Champigneulles, France

Filed Mar. 24, 1981, Ser. No. 246,952
Claims priority, application France, Mar. 24, 1980, 80 06464
Int. Cl.[4] G01N *21/00*
U.S. Cl. 356—339 13 Claims



1. An apparatus for measuring the colloidal stability of liquids such as nutritional liquids, such as beers, wines and other drinks obtained by fermentation, or gaseous drinks, and oils, in particular, by measuring the diffusion S_1 of the light emitted by a helium-neon laser in proportions appropriate for emitting a wavelength of 6328 Å, said apparatus comprising essentially in combination with a laser of said wavelength and with a semi-transparent mirror or similar for reflecting a part S_0 of an exciting light beam emitted by the laser, in the direction of a reference photopile: a sample-holder containing a sample of the liquid the turbidity of which, when cold, it is desired to measure; a cooling tank which contains the sample-holder and which is associated with a cooling unit of appropriate type; a photopile for analyzing and measuring the light flux from the laser light source, diffused through the sample to be checked; said reference photopile for permanently controlling the intensity of the exciting beam; a logic system associated with a microprocessor, said logic system for cyclically performing the following operations: (a) programmed automatic change of sensitivity, i.e. adjustment of load resistors; (b) standardization allowing a direct measurement in formazine standards; (c) automatic sample handling with the help of a timer internal to the microprocessor; (d) calculation of the quotient S_1/S_0 between the two electrical signals corresponding to the scattered flux S_1 and the emitted flux S_0, received via said two photopiles; and displaying the value of S_1/S_0.

4,547,071

METHOD AND APPARATUS FOR MEASURING DENSITY GRADIENT

Heshel Teitelbaum, Ottawa, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada

Filed Jun. 30, 1982, Ser. No. 393,827
Claims priority, application Canada, Nov. 19, 1981, 390142
Int. Cl.[4] G01N *21/22*
U.S. Cl. 356—344 14 Claims

1. A device for measuring the gradient of density in a fluid, said device comprising:

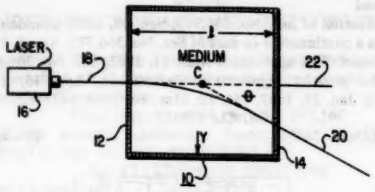
transparent container means for containing said fluid;

a laser for providing a columnar light beam located on one side of said container means;

a photodetector axially aligned with said laser on the other side of said container means, said photodetector detecting the displacement of said light beam caused by the gradient of refraction of said fluid;

said photodetector being comprised of four pie-shaped segments oriented in a plane perpendicular to said beam forming a circular array, each of said segments producing

a current which is proportional to the surface area of said segment impinged by said beam; and



means connected to said photodetector for converting said displacement into an indication of the gradient of refraction and thereby the gradient of the density of said fluid.

4,547,072

OPTICAL FIBER GYRO

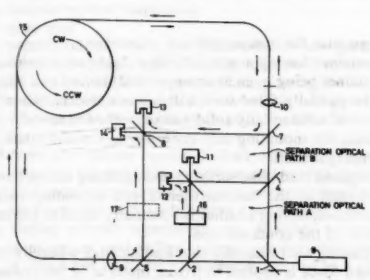
Kenichi Yoshida; Takashi Yokohara; Kimizo Ono; Yoshikazu Nishiwaki, and Koichi Tsuno, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jun. 7, 1983, Ser. No. 502,063

Claims priority, application Japan, Jun. 9, 1982, 57-98995

Int. Cl.⁴ G01B *9/02*; G01C *19/64*

U.S. Cl. 356—350 **7 Claims**



1. An optical fiber gyro system, comprising:
an optical fiber loop comprising a single mode optical fiber wound a number of turns;
a laser;
a half-mirror for dividing a laser beam into a clockwise beam and a counterclockwise beam which are respectively applied to either end of said optical fiber loop;
a first separation optical path including said half-mirror and further half-mirrors;
a second separation optical path including said half-mirror and still further half-mirrors;
two pairs of optical detectors disposed in said first and second separation optical paths, respectively;
a phase shifter inserted in at least one of said separation optical paths; and
a phase difference calculating circuit for calculating a phase difference $\Delta\theta$, in which
two functions in $\Delta\theta$ are obtained, the domain T of said phase difference $\Delta\theta$ is divided into prime domains T_1, T_2, . . . and T_n, eigenfunctions S_1, S_2, . . . and S_n are calculated as linear couplings of said two functions, and when $\Delta\theta$ is in a prime domain T_i, said phase difference $\Delta\theta$ is determined from an eigenfunction S_i.

4,547,073

SURFACE EXAMINING APPARATUS AND METHOD

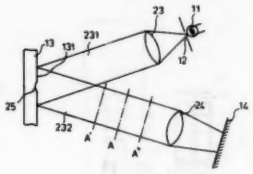
Koichi Kugimiya, Toyonaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 11, 1982, Ser. No. 348,086

Claims priority, application Japan, Feb. 17, 1981, 56-21775[U]; May 13, 1981, 56-71719

Int. Cl.⁴ G01B *11/30*; G01N *21/88*

U.S. Cl. 356—371 **26 Claims**



15. A method for examining a surface, comprising the steps of:
shining light rays from a substantially point light source,
making said rays impinge on a surface to be examined, and reflect therefrom,
converging the rays reflected from said surface and projecting them substantially undiminished onto an image-receiving means to form a defocussed image with respect to said surface to be examined, and
obtaining a shading pattern in said defocussed image which corresponds to an unevenness on said surface to be examined.

4,547,074

COLOR SENSING DEVICE

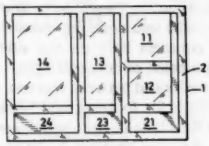
Seisuke Hinoda, Uji; Masao Hirano, Takatsuki; Mitsutaka Kato, and Hirohiko Yasuda, both of Kyoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed May 7, 1982, Ser. No. 376,138

Claims priority, application Japan, May 8, 1981, 56-69838

Int. Cl.⁴ G01J *3/50*

U.S. Cl. 356—405 **10 Claims**



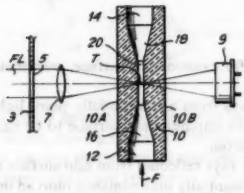
1. A color sensing device comprising:
a semiconductor substrate,
a plurality of photoelectric transducers formed on said substrate, and
filter means provided on the light receiving face of each of said transducers,
wherein said filter means has a spectral transmittance substantially corresponding to the normalized wavelength distribution of each value of the tristimulus values $\bar{x}$, $\bar{y}$ and $\bar{z}$, and
wherein each area of the light receiving faces of said transducers is so determined as to substantially correspond to each peak value of the tristimulus values $\bar{x}$, $\bar{y}$ and $\bar{z}$.

4,547,075

DEVICE FOR THE DETECTION AND CALCULATION OF PARTICLES PRESENT IN A MOVING SUSPENSION FOR HEMATOLOGICAL ANALYSES AND THE LIKE

Alberto Fei, Florence, Italy, assignor to Dr. Alberto Ciampolini Strumenti Scientifici, Italy

Filed Feb. 16, 1984, Ser. No. 580,890
Claims priority, application Italy, Feb. 23, 1983, 9347 A/83
Int. Cl.[4] G01N *21/00*
U.S. Cl. 356—440 4 Claims



1. A device for detecting particles suspended in a flow medium comprising:

a block defining a flow conduit therein for the passage of the flow medium with suspended particles, in a flow direction through the block, said flow conduit comprising an entrance section for receiving the flow medium, a first funnel-shaped coupling zone connected to said entrance section, a counting channel connected to said first funnel-shaped coupling zone, a second funnel-shaped coupling zone connected to said counting channel and an exit section connected to said second funnel-shaped coupling zone, said counting channel having a cross-section transverse to the flow direction which is rectangular and which is small with respect to a cross-section of said entrance and exit sections, said block being transparent to coherent light in the direction transverse to said flow direction and at least through said counting channel;

a source of coherent light on one side of said block for generating a beam of coherent light;

optic means positioned between said source of coherent light and said block for focusing said beam of coherent light into a thin flat blade of light which passes transversely to said flow direction through said counting channel, said blade of light having a thickness in said flow direction which is small with respect to a width of said counting channel transversely to the flow direction, said optic means forming said blade of light to span the entire cross-section of said counting channel transverse to said flow direction; and

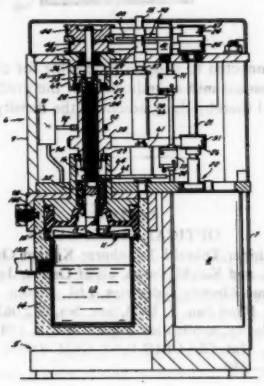
a photodetector on the side of said block opposite from said optic means for receiving said blade of light from said counting channel, said photodetector being capable of detecting a fluctuation in light from said beam of light caused by the passage of a single particle suspended in the flow medium, and counting said fluctuations for providing a numeric count of particles suspended in the flow medium as the flow medium passes in the flow direction through said counting channel.

4,547,076

METHOD AND APPARATUS FOR MAKING SOFT-ICE IN SMALL QUANTITIES

Wilhelm Maurer, Talacherring 15, 8103 Unterengstringen, Switzerland

Continuation of Ser. No. 536,775, Sep. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 366,773, Apr. 8, 1982, abandoned. This application Mar. 11, 1985, Ser. No. 709,845
Claims priority, application Switzerland, Apr. 15, 1981, 2521/81; Jan. 26, 1982, 466/82; Mar. 10, 1982, 1473/82
Int. Cl.[4] F25C *5/12*
U.S. Cl. 366—244 10 Claims



7. Apparatus for making soft-ice, comprising:

A. container having a substantially cylindrical interior, said container being open at an upper end thereof and adapted to be partially filled with soft-ice mix that is frozen to a body of substantially solid and unfrothed material;

B. means for mounting said container in coaxial relation to an upright shaft;

C. elongated blade-like scraping and agitating means fixed to said shaft at the bottom thereof and extending radially therefrom, having a radius substantially equal to the inside radius of the container and

(1) having a substantially thin leading edge whereby localized force is applied to frozen material in the container in consequence of rotation of the shaft in one direction and relative axial advance between the shaft and the container, which force momentarily melts said material in a moving zone adjacent to said leading edge that progresses through the body of material, and

(2) having agitator portions behind said leading edge whereby momentarily melted material is deflectingly agitated by rotation of the shaft; and

D. means for actuating said shaft comprising rotational drive means and further comprising

(1) first transmission means providing a rotational driving connection between said rotational drive means and said shaft whereby the latter is driven for rotation in said one direction

(a) with a rotational force adequate to effect momentary melting of said material and

(b) at a rotational speed consistently high enough to produce whipping of momentarily melted material, and

(2) second transmission means connected with said rotational drive means for effecting relative axial advance between said shaft and the container at a rate which has a predetermined relationship to said rotational speed and which is low enough to ensure that all frozen material through which said scraping and agitating means moves is momentarily melted and which, by its con-

stancy, ensures momentary melting and whipping of substantially all of the frozen material in the container.

4,547,077
MODE SELECTION ARRANGEMENT FOR USE IN A TIMER

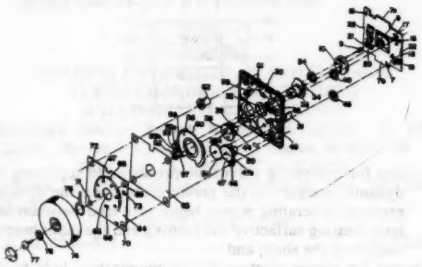
Isao Arichi, Kurashiki; Takuji Koh, Okayama, and Isao Nanba, Kurashiki, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed Mar. 30, 1984, Ser. No. 595,166

Claims priority, application Japan, Mar. 30, 1983, 58-46001[U]; Mar. 30, 1983, 58-46002[U]

Int. Cl.⁴ G04F *8/00*; H01H *7/08*

U.S. Cl. 368—107 **8 Claims**



1. A mode selection arrangement for use in a timer for selecting various modes comprising:

a gear box;

a printed circuit board provided adjacent said gear box;

at least one predetermined contact pattern formed on a face of said printed circuit board facing said gear box;

display gear means provided rotatably in said gear box, said display gear means having a plurality of indicia depicted on its face;

switch gear means having a shaft extending through said gear box for rotatably mounting said switch gear means in said gear box, said switch gear means rotating operatively or integrally with said display gear means;

a sliding contact member fixedly attached to said switch gear means, said sliding contact member being formed by a thin layer of metal substantially shaped as a circle, the circumference of the sliding contact member having an undulating wave shape as to provide a plurality of peak points equally spaced one from the other, a contact point being formed at each peak of said wave, said sliding contact member having an engagement opening formed at the center thereof for being mounted on said shaft of said switch gear means, said engagement opening having at least one slit extending therefrom; and

a front plate provided to close said gear box, said front plate having at least one window formed therein for the display of said indicium through said window.

4,547,078
METHOD AND DEVICE FOR MEASURING STEAM QUALITY

Stephen L. Long, Houston; Yin L. Cheung, Sugarland, and Alfred Brown, Houston, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 9, 1984, Ser. No. 587,772

Int. Cl.⁴ G01N *31/00, 11/00*

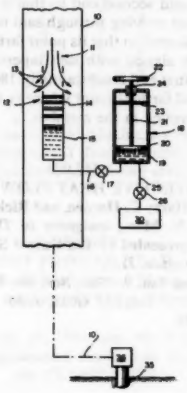
U.S. Cl. 374—42 **9 Claims**

3. In a steam injection procedure for recovering oil by introducing steam through a steam line into one or more injection wells, a method for determining the quality of saturated super-atmospheric pressure steam in said steam line, said saturated steam having liquid and vapor components and being generated from feedwater having a predetermined concentration of solids, which method comprises:

obtaining a sample of the liquid component of said saturated steam at said super-atmospheric pressure,

withdrawing at least a portion of said liquid sample in a manner which prevents the super-atmospheric pressure of said saturated steam from changing substantially,

determining the concentration of solids in said withdrawn liquid sample, and



obtaining the quality of said saturated steam from the equation $X_S = 1-(C_F/C_S)$,

where

X_S is the saturated steam quality,

C_F is said predetermined concentration of solids in the feedwater, and

C_S is said determined concentration of solids in the withdrawn liquid sample.

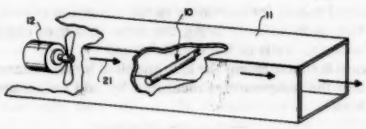
4,547,079
AVERAGING TEMPERATURE RESPONSIVE APPARATUS

Leo Alamprese, Wood Dale, and Lawrence E. Donahue, Arlington Heights, both of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 4, 1984, Ser. No. 596,494

Int. Cl.⁴ G01K *3/02, 1/16*

U.S. Cl. 374—116 **5 Claims**



1. An averaging temperature responsive device for use in sensing the average temperature of air passing through a duct comprising:

a hollow, elongated member to be mounted inside a duct, said member having first and second ends and a length therebetween, said first end for supporting said member inside said duct;

said member having a plurality of air intake holes substantially along the length thereof, said holes having areas of decreasing size from the hole near the first end of said member to a hole near the second end of said member, said

plurality of air intake holes permitting air from said duct to enter said member;

said member having an exhaust opening at said second end for permitting air moving through said duct which enters said plurality of air intake holes to be exhausted from inside said member, the total area of said holes being less than the area of said exhaust opening; and,

a temperature responsive element for sensing the average temperature of air moving through said member, said temperature responsive element being located within said member at said second end so that it senses the temperature of the air moving through said member, said exhaust opening is slanted so that its point farthest from said end is substantially aigned with said tapered slot and its point nearer said first end is substantially 180° around said member from said farthest point whereby the flow characteristics are improved in the member.

4,547,080

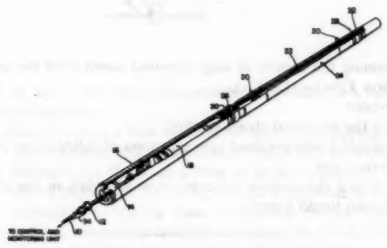
CONVECTIVE HEAT FLOW PROBE

James C. Dunn; Harry C. Hardee, and Richard P. Striker, all of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 9, 1984, Ser. No. 569,086

Int. Cl.⁴ G01K *1/16*

U.S. Cl. 374—135 **11 Claims**



1. A convective heat flow probe comprising:

an elongate housing including means for enabling the housing to be lowered down into a borehole;

heater means extending along the probe for heating the formation surrounding the borehole, said means comprising a heating element and at least one temperature sensor;

at least two separate units supported by said housing, each of said units including a heater pad, a heating element and a temperature sensor for measuring the temperature of the surrounding formation after heating thereof by said heater means;

control means for providing radial expansion of said at least two units so as to bring the units into firm engagement with the walls of the borehole; and

means for monitoring the heat supplied by said heater means and the temperatures measured by said temperature sensors.

4,547,081

DYNAMIC PRESSURE TYPE FLUID BEARING

Katsuhiko Tanaka, Yamoto, and Ikunori Sakatani, Fujisawa, both of Japan, assignors to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 406,868, Aug. 10, 1982, abandoned. This application May 17, 1984, Ser. No. 611,385

Claims priority, application Japan, Aug. 26, 1981, 56-132814

Int. Cl.⁴ F16C *17/10*

U.S. Cl. 384—107 **6 Claims**

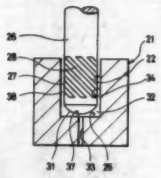
1. A dynamic pressure type fluid bearing comprising:

a housing provided with a cylindrical hole having a cylindrically shaped inner peripheral surface and a bottom surface;

a shaft disposed in said cylindrical hole and having a cylindrically shaped outer peripheral surface opposed to and cooperative with said inner bearing surface to bear radial load and an end surface opposed to and cooperative with said bottom surface to bear thrust load;

a pressure chamber formed between the bottom surface of the housing and the end surface of the shaft;

means including a communication hole provided in said bottom bearing surface, the communication hole opening to the outside of said housing;



means for generating a dynamic pressure and supplying the dynamic pressure to the pressure chamber, the dynamic pressure generating means being provided between said inner bearing surface of the housing and the outer bearing surface of the shaft; and

means for communicating the communication hole to the pressure chamber when the dynamic pressure is supplied from the dynamic pressure generating means and discommunicating the communication hole from the pressure chamber when the bearing is stationary.

4,547,082

BEARING CONSTRUCTION OF A CRANKSHAFT OF A COLD PILGER ROLLING MILL, OR THE LIKE

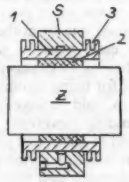
Josef Gerretz, Viersen, and Klaus Rehag, Monchen-Gladbach, both of Fed. Rep. of Germany, assignors to Mannesmann Demag Wean, Pittsburgh, Pa.

Filed Sep. 7, 1982, Ser. No. 392,492

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1981, 3127198

Int. Cl.⁴ F16C *37/00*

U.S. Cl. 384—278 **9 Claims**



1. A bearing construction for use in supporting a member subject to relatively high speed and/or heavy load such as certain members of a rolling mill and for mounting said mill member onto a shaft for rotation therebetween, and wherein said bearing construction is exposed to an external cooling fluid employed for the rolling mill, said construction comprising:

a first bearing member, and

a second bearing member made of a material that is subject to decreased performance and/or failure when subjected to excessive heat due to said high speed and/or heavy load, and having a relatively low thermal conductivity with respect to said first bearing member,

said first bearing member made of a high strength material

having a high thermal conductivity relative to said second bearing member,

said first and second bearing members arranged concentrically with respect to each other and located concentrically between said shaft and said mill member, said first and second bearing members having slideable load carrying surfaces contacting each other which are subject to the generation of frictional heat during operation of said mill member,

said first bearing member including cooling means having substantially similar portions extending outwardly of said first member's load carrying surface on opposite ends thereof and having sufficient exposed areas that during said operation said areas are brought into contact with said external cooling fluid to dissipate said frictional heat from said first bearing member to thereby protect said second member from said excessive heat.

4,547,083

BEARING DEVICE FOR AN EXHAUST GAS TURBO-CHARGER WITH TANDEM ROLLING-CONTACT BEARINGS

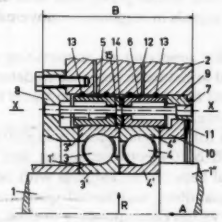
Hansulrich Hörler, Zurich, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Nov. 13, 1984, Ser. No. 670,576

Claims priority, application Switzerland, Nov. 30, 1983, 6401/83

Int. Cl.⁴ F16C *27/04*

U.S. Cl. 384—535 **10 Claims**



1. Bearing device on an exhaust gas turbo-charger with tandem rolling-contact bearings in which each rolling-contact bearing outer race is fixed in its own bearing support ring and the bearing support rings are penetrated by a multiplicity of rotationally symmetrically located spring rods which extend parallel to the axis of the turbo-charger, the ends of the spring rods remote from the bearing being rigidly fixed relative to the bearing housing wherein:

(a) the bearing support rings have dogs on their mutually facing end surfaces, which dogs each penetrate with axial clearance and tangential clearance into recesses lying opposite, and

(b) the spring rods are retained in the dogs by means of a retention collar.

4,547,084

CAGE FOR ROLLER BEARINGS

Hans Meining, Dittelbrunn, and Rüdiger Hans, Niederwerrn, both of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

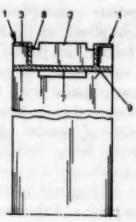
Filed Oct. 4, 1984, Ser. No. 657,593

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1983, 8329410[U]

Int. Cl.⁴ F16C *33/56*

U.S. Cl. 384—576 **9 Claims**

1. A cage for roller bearings made of a plastic material consisting of two annular side parts and a plurality of circumferentially spaced crosspieces joining the side parts to form pockets for the rolling elements, said pockets including elastically deformable retaining projections for guiding said rolling elements and retaining them in the cage, said side parts (1) having a U-shaped cross-section with axially outwardly directed shanks (3, 4) and said crosspieces (2) consisting of two



thin-walled, curved parts (5, 6) which are arranged around the periphery at a predetermined distance from one another, the outer surfaces (10*a*) of these parts being arranged to face each other.

4,547,085

DOT PRINTER HEAD

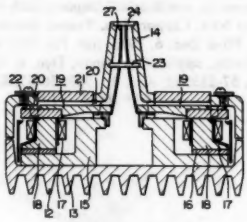
Kuniaki Ochiai; Takashi Norigoe, and Masayuki Iinuma, all of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1984, Ser. No. 572,252

Claims priority, application Japan, Jan. 24, 1983, 58-9731

Int. Cl.⁴ B41J *3/12*

U.S. Cl. 400—124 **6 Claims**



1. A dot printer head comprising:

(a) a case;

(b) a guide holder attached to said case and projecting therefrom in a direction which, during use of the dot printer head, is at least generally perpendicular to a platen;

(c) a plurality of electromagnets mounted in said case;

(d) a plurality of needles each one of which is operatively connected to and is movable in its longitudinal direction by one of said plurality of electromagnets, said plurality of needles extending through said guide holder and having working ends which, during use of the dot printer head, form a straight line which is orthogonal to the axis of the platen, each of said plurality of needles being curved three-dimensionally such that, in the direction orthogonal to the straight line formed by the working ends of said needles, the portions of said needles adjacent to their working ends form an angle α which is slightly less than 90° to the platen, while, in the direction parallel to the straight line formed by the working ends of said needles, the portions of said needles adjacent to their working ends form an angle β of 90° to the platen;

(e) a planar tip guide plate mounted in the distal end of said guide holder in a position which, during use of a dot printer head, is parallel and adjacent to the platen, said planar tip guide plate having a plurality of guide holes formed therein, each of said plurality of guide holes receiving and bending one of said needles and being formed in such a manner that

the longitudinal axis thereof through said planar tip guide plate is orthogonal to the plane of said planar tip guide plate, said planar tip guide plate serving to array the working ends of said needles in said straight line; and

(f) a planar intermediate guide plate mounted in said guide holder between said planar tip guide plate and the proximal end of said guide holder, said planar intermediate guide plate being parallel to said planar tip guide plate and having a plurality of elongated guide holes formed therein, each of said plurality of elongated guide holes receiving and bending one of said plurality of needles, each of said plurality of elongated guide holes being formed in such a manner that the longitudinal axis thereof through said planar intermediate guide plate is orthogonal to the plane of said planar intermediate guide plate and the longitudinal axis thereof in the plane of said intermediate guide plate is directed radially relative to a common central axis which is orthogonal to the plane of said planar intermediate guide plate, said planar intermediate guide plate serving to bend said plurality of needles while compressing and bundling them in the direction of said straight line.

4,547,086

PIEZOELECTRICALLY DRIVEN PRINTING MECHANISM FOR DOT MATRIX PRINTERS

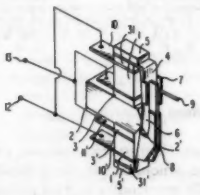
Michio Matsumoto, and Kunio Kitagawa, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Dec. 6, 1983, Ser. No. 558,741

Claims priority, application Japan, Dec. 6, 1982, 57-213541; Dec. 6, 1982, 57-213542; Apr. 1, 1983, 58-57542

Int. Cl.⁴ B41J *3/12*

U.S. Cl. 400—124 **3 Claims**



1. A printing hammer mechanism comprising:

a piezoelectric element having an electrode, to which a voltage is applied to expand and contract said piezoelectric element along a first axis, and first and second end surfaces intersecting said first axis;

a link means connected to said first and second end surfaces of said piezoelectric element intersecting said first axis and movable along a second axis perpendicular to said first axis, said link means having a first arm portion engaging said first end surface and a second arm portion engaging said second end surface, said second arm portion being disposed substantially parallel to said first axis and having the length longer than said first arm portion, the end of said first arm portion not engaging said first end surface being connected to the intermediate portion of said second arm portion; and

a printing element fixed to the free end of said second arm portion such that said printing element is moved in the direction of said second axis in response to the expanding and contracting of said piezoelectric element.

4,547,087

MICROPROCESSOR-CONTROLLED PRINTING MECHANISM HAVING AN OPTO-ELECTRONIC SENSOR

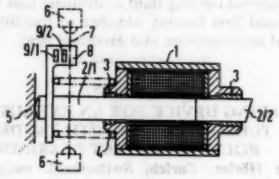
Ulrich Heider, and Hans Kern, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 21, 1983, Ser. No. 563,814

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1983, 3301827

Int. Cl.⁴ B41J *9/38*

U.S. Cl. 400—144.2 **7 Claims**



1. In a printing system incorporating an armature and a driving coil therefore, said armature functioning as a print hammer and a stop for positively locating said armature in its rest position, the combination comprising;

an opto-electronic sensor juxtaposed with said armature for developing signals in response to movement of said armature,

drive means for supplying an accelerating or decelerating pulse to said armature in response to determination of the time required for said armature to travel over a predetermined distance,

control means for receiving plural successive signals generated by said opto-electronic sensor and comparing the time interval between said signals with one of a plurality of stored quantities, said stored quantities comprising a plurality of values corresponding to three separate predetermined intervals of motion of said armature, and a plurality of correction values being stored at locations in memory associated with said stored quantities and corresponding to accelerating or decelerating movement of said armature,

means for controlling said drive means for accelerating said armature, during an accelerating interval in accordance with said correction values,

means for controlling said drive means for decelerating said armature through a first deceleration interval, and for decelerating said armature through a second deceleration interval immediately prior to the armature returning to said rest position,

in accordance with said correction values, said correction values corresponding to exciting current required by said drive means to modify the existing value of armature velocity to a predetermined prescribed velocity.

4,547,088

CORRECTABLE THERMAL TRANSFER PRINTING RIBBON

Meredith D. Shattuck, Hollister, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

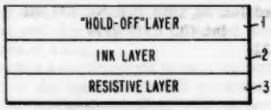
Filed Jun. 26, 1980, Ser. No. 163,351

Int. Cl.⁴ B41J *31/00*

U.S. Cl. 400—241.1 **1 Claim**

1. A ribbon for correctable thermal transfer printing, said ribbon comprising an ink layer and on top of said ink layer a thermoplastic hold-off layer which prevents penetration by the

ink layer into a substrate being printed upon, wherein the hold-off layer comprises polyvinylpyrrolidone, poly(ethylene



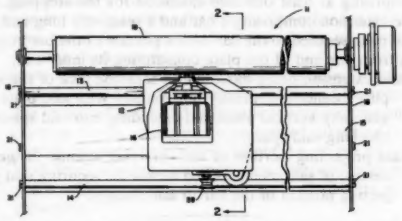
oxide), methyl vinyl ether/maleic acid copolymer, N-vinyl pyrrolidone/vinyl acetate copolymer or poly(ethylene glycol).

4,547,089

GUIDE FOR A PRINT HEAD OF A PRINTING DEVICE

Werner Jung, Morton Grove, and Alfred Z. Purzycki, Arlington Heights, both of Ill., assignors to AT&T Teletype Corporation, Skokie, Ill.

Filed Aug. 19, 1983, Ser. No. 524,519
Int. Cl.⁴ B41J *19/30*
U.S. Cl. 400—354 **1 Claim**



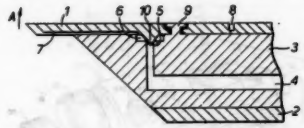
1. A printing device for printing on a line on the record medium supported by a platen, the device comprising:
a print head,
a carriage for supporting the print head,
a unitary one piece guide comprising:
first and second parallel guide rails for supporting and guiding the carriage, each guide rail having a substantially elliptical cross-section, the major axes of the two cross-sections being substantially perpendicular to each other,
a web of substantially uniform thickness and having a substantially U-shaped cross-section joining the two guide rails,
first and second opposite rotatably mounted sheaves located on the carriage, the sheaves having their axes of rotation substantially perpendicular to the center line of the print head and arranged to engage the first guide rail,
the first sheave having two individually mounted halves,
means for varying the distance between the two individually mounted halves of the first sheave parallel to the axis of rotation of the sheave,
a third sheave rotatably mounted on the carriage having its axis of rotation substantially parallel to the center line of the print head and arranged to engage the second guide rail, and,
means for varying the position of the third sheave along a line substantially perpendicular to the axis of rotation of the sheave.

4,547,090

WRITING INSTRUMENT WITH NIB OPERATED VALVE

Hugh W. B. Baker, Beaconsfield; Valerie A. Buckle, Slough, and Ivor J. M. Fehr, Old Basing, all of England, assignors to The Gillette Company, Boston, Mass.

Filed Mar. 15, 1983, Ser. No. 475,431
Int. Cl.⁴ B43K *5/18, 8/02*
U.S. Cl. 401—235 **11 Claims**



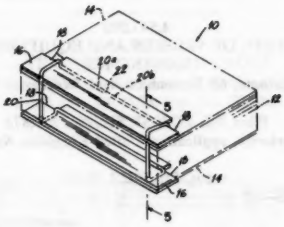
1. A reservoir pen comprising a barrel enclosing an ink reservoir, said barrel being unitary with a nib and connecting resilient hinge, a feed bar underlying the nib and defining an ink feed channel for supplying ink from the reservoir to the underside of the nib, and valve means for controlling the ink feed and actuated by the nib, the nib being arranged to deflect against the resilience of the hinge under normal writing pressure to control ink flow to the nib.

4,547,091

FILE FASTENERS

Bhagavan V. Josyula, and George Spector, both of 233 Broadway, Rm. 3615, New York, N.Y. 10007

Filed Aug. 16, 1984, Ser. No. 641,788
Int. Cl.⁴ B42F *3/00*
U.S. Cl. 402—12 **6 Claims**



1. A file fastener which comprises:
a. a stack of paper sheets, each said sheet having two holes;
b. a pair of protective covers, each said cover having two holes and placed on top and bottom of said sheets;
c. a pair of plates, each said plate having two holes and two notched corners, each said notched corner in alignment with one of said holes with each said plate placed on top and bottom of said covers;
d. a pliable hollow tube passing through said holes in said sheets said covers and said plates and around said notched corners in said plates; and
e. means for securing both ends of said tube together to form a continuous locking band thereof.

4,547,092

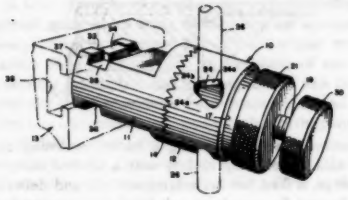
ACCESSORY CLAMP FOR MEDICAL TABLE

Gary V. Vetter, Valders; Leonard J. Yindra, Manitowoc, and Wilbur E. Gilbert, Two Rivers, all of Wis., assignors to Hamilton Industries, Two Rivers, Wis.

Filed Feb. 21, 1984, Ser. No. 582,177
Int. Cl.⁴ F16C *11/00*
U.S. Cl. 403—59 **14 Claims**

1. A clamp for releasably securing an accessory rod to a medical table, comprising a clamp body having a cup section

and a base section; said sections being disposed in axial alignment and having a pair of opposing first ends with means for locking said sections against independent relative rotation when said ends are engaged; said cup section having a centrally-apertured transverse wall adjacent said first end and having a chamber leading to an opening at a second end opposite the first end thereof; said base section having a threaded stem extending axially from said first end of said base section, through said apertured wall, and into said chamber of said cup



section; a first operating knob threadedly and rotatably mounted upon the end of said stem remote from said base section; said cup section having a pair of openings in the side wall thereof aligned with each other along a line disposed lateral to said stem and along a plane normal to the axis of said body; said pair of side wall openings being adapted to receive a support rod of an accessory to be secured to a medical table by clamping engagement of such support rod when said first operating knob is tightened upon said threaded stem.

4,547,093

PROTECTION OF VESSELS AND EQUIPMENT FROM MOVING ICE

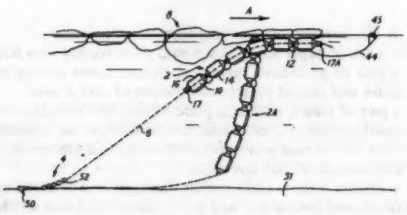
John A. Statham, 68 Battenhall Ave., Worcester WR5 2HW, England

Filed Jul. 27, 1983, Ser. No. 517,873

Claims priority, application United Kingdom, Aug. 10, 1982, 8223050

Int. Cl.⁴ E02B *15/02*

U.S. Cl. 405—61 **15 Claims**



1. Apparatus for protecting an installation from floating ice moving towards the installation, comprising:

an array of buoyant drag elements upstream of the installation;

a number of underwater anchorages upstream of the installation;

anchor lines connecting the drag elements to the anchorages; and

ice penetration means projecting upwards from the surface of the drag elements for penetrating the underside of ice moving over the drag elements, whereby the ice is decelerated.

4,547,094

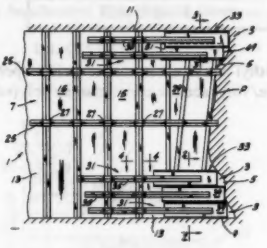
MINE STOPPING

William R. Kennedy, and John M. Kennedy, both of P.O. Box 38, Taylorville, Ill. 62568

Filed Jan. 30, 1984, Ser. No. 574,984

Int. Cl.⁴ E21F *1/14*

U.S. Cl. 405—132 **7 Claims**



1. A mine stopping comprising a plurality of elongate extensible panels extending vertically from the floor to the roof of a passageway in a mine, each panel comprising upper and lower panel members each of channel shape in cross section having a web and flanges at opposite sides of the web, one of the members having a sliding fit in the other with the flanges extending toward one face of the stopping, said panels impeding flow of air through the passageway except for a space at a side of the passageway because of irregularity of the side of the passageway, and means for impeding flow of air through said space comprising at least one side extension for the stopping, said side extension comprising a bar and a relatively long and narrow plate secured to the bar with a portion of the bar projecting from one end of the plate constituting its inner end;

said extension being mounted on said one face of the stopping extending generally horizontally with said plate in a generally vertical plane and extending into said space for blocking said space;

said projecting portion of the bar lying against flanges of certain of said members and means for securing said projecting portion of the bar to said flanges.

4,547,095

METHOD FOR THE CONSTRUCTION, TRANSPORTATION AND SITE INSTALLATION OF A DEEP-SEA LATTICE STRUCTURE

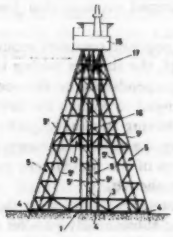
Carla Macchi, Brescia, and Franco Nicolussi, Venice, both of Italy, assignors to Tecnomare S.p.A., Venice, Italy

Filed Mar. 23, 1984, Ser. No. 592,567

Claims priority, application Italy, Mar. 30, 1983, 84108 A/83

Int. Cl.⁴ E02B *17/00*

U.S. Cl. 405—206 **6 Claims**



1. A method for the construction, transportation and site installation of a gravity-supported deep-sea lattice structure comprising a base from which several lattice legs branch to

support a plant-carrying deck at their ends above the water, characterised by comprising the following stages in succession:

in a dry dock, constructing said base, to which the first leg portions are welded;

towing said lower self-floating part of the lattice structure from said dry dock to a protected deep water zone by means of a tug;

connecting a floating dock to each leg portion of said lower part of the structure in such a manner that it can be released from and slide along said leg portion, said floating dock being provided with lifting and welding equipment and with automatic raising and liquid ballasting systems;

joining the second leg portions, one per leg, to the pre-existing part of the structure, said portions being prefabricated in different construction yards, brought to site by pontoons, and positioned and welded to the underlying structure by means of the cranes and the welding means of said floating docks;

in a controlled manner, lowering the structure obtained after said joining operations by means of said liquid ballasting and automatic raising systems on the floating docks in order to return it to its initial state in which it is arranged for the joining of the next portions;

continuing the joining of further leg portions by repeating the two latter said stages until approximately one half of the forseen height for the lattice structure is reached;

joining to the structure under assembly an intermediate lattice girder system for stiffening the structure by means of loading operations consisting of positioning the lattice girder supported by a pontoon on the connection cones of the underlying structure, making the structure re-emerge by removing liquid ballast until said lattice girder becomes mounted on to it, removing the pontoon and carrying out the necessary welding operations;

repeating the operations for joining the other leg portions, and completing the structure summit by means of the floating dock cranes;

removing from said floating docks the cranes, machinery and plant used only for the construction, and, by operating the liquid ballasting and automatic raising systems on said floating docks, causing the assembled structure to re-emerge to about one half its height, i.e. to the allowable draft level along the transportation route and which provides sufficient nautical floatability and stability to said structure;

using tugs, towing the assembled structure from said protected deep water zone to its place of installation in the open sea using the floating docks as pontoons for providing additional support and allowing temporary control of the marine operations;

lowering the structure to the depth at which it is stable without the floating docks by operating the liquid ballasting system and the automatic raising system on these latter;

removing and recovering all the floating docks except for one floating dock together with its liquid ballasting and automatic raising system, by which the total lowering of the structure is completed; and finally

also recovering this latter floating dock and loading said plant carrying deck on to the lattice structure in the usual operational manner.

4,547,096

ALIGNMENT OF TUBULAR PILES FOR JOINDER

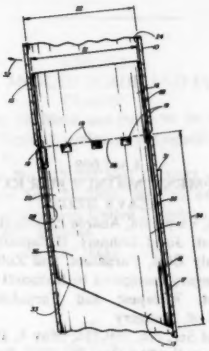
Verlon C. Daigle, Gray, and Wayne R. Smith, Thibodaux, both of La., assignors to McDermott International, Inc., New Orleans, La.

Filed Aug. 1, 1983, Ser. No. 519,457
Int. Cl.[4] E02D *5/08, 5/16*
U.S. Cl. 405—251 **11 Claims**

1. An aligner for aligning a first tubular pile to a second tubular pile, comprising:

a generally cylindrical member connected to the first tubular pile, having a forwardly extending pointed tapered end portion, and extending generally coaxially from one end thereof, the extended portion of the cylindrical member being disposed for insertion into an end portion of a second tubular pile having an inner diameter greater than the outer diameter of said extended portion;

at least one first shim member disposed adjacent said one end of the first tubular pile between and in engagement with



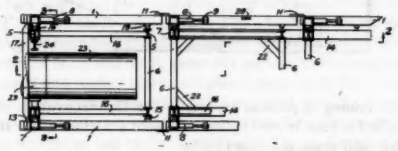
the outer surface of said cylindrical member extended portion and the inner surface of the second tubular pile, when said cylindrical member extended portion is inserted in the second tubular pile, to maintain the first tubular pile in alignment with the second tubular pile; and a second shim member attached to the outer surface of said cylindrical member at the lowermost end of said forwardly extending tapered end portion thereon.

4,547,097

TRAVELING TRENCH SHORE

Noel G. Bell, 52 West Hudson Ave., Englewood, N.J. 07631

Filed Jun. 15, 1983, Ser. No. 504,501
Int. Cl.[4] E21D *5/12*
U.S. Cl. 405—283 **9 Claims**



1. A traveling trench shoring device of the type consisting of longitudinal panels which cover the walls of the trench, the panels being supported transversely against the walls of the trench by movable frames on which hydraulic jacks are mounted that are connected to the panels and move the panels forward, the reaction for the jacks being taken by the frames which are held in position by other jacks attached to other panels, which panels are held stationary by the friction between them and the walls of the trench; the device comprising:

a work chamber which supports the walls of the trench where permanent structure is installed, and a separate unconnected leading section which supports the walls of a sloping approach to the trench, the two sections being adjoining and in longitudinal alinement;

said panels being movable vertically individually in succession;

the panels having plates on their lower outer edges and ends to cover the junction with panels below and behind them and prevent entry of earth between them;

and the jacks being mounted on collars on the frames, and

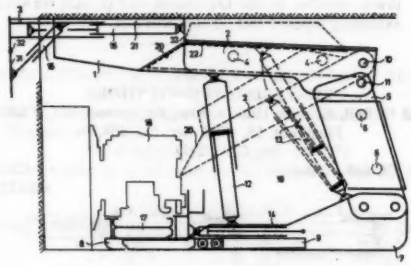
the collars and jacks also being movable vertically and indvidually in conjunction with the panels.

4,547,098

MINING EQUIPMENT, MAINLY FOR EXTRACTION OF HEAVY BEDS

Mátyás Martinkó, Várpalota; András Elekes, Budapest; Kálmán Simon, Budapest; József Bohnert, Budapest; Janós Neméth, Budapest; Károly Bóle, Várpalota, and Zoltan Ilyes, Budapest, all of Hungary, assignors to Kozponti Banyaszati Fejlesztesi Intezet, Budapest and Varpalotai Szenbenyak, Várpalota, both of, Hungary

Continuation of Ser. No. 260,216, May 4, 1981, Pat. No. 4,386,878. This application Dec. 29, 1982, Ser. No. 454,151
Claims priority, application Hungary, May 6, 1980, 1104/80
The portion of the term of this patent subsequent to Jun. 19, 2001, has been disclaimed.
Int. Cl.[4] E21D *23/00*
U.S. Cl. 405—291 **6 Claims**



1. A mining apparatus especially for the excavation of a heavy bed at least in part by the caving of a portion of the roof thereof, said apparatus comprising:

a main base displaceable along a mining gallery in the direction of a mining face;

a conveyor mounted on said main base for receiving mineral matter excavated from said face;

a roof plate overhanging a forward portion of said main base and adapted to support the roof of said gallery immediately behind the face during excavation thereof;

a rear base mounted on a rear portion of said main base and extending upwardly therefrom;

a back member pivotally connected to said rear base for tilting movement relative thereto, said back member being connected to said roof plate and overhanging said main base, thereby shielding a portion of said main base from material falling from the roof of said gallery, said back member having a portion forming a door framed by another portion of the back member and tiltable downwardly to form a chute directing caved material from said roof onto said conveyor; and

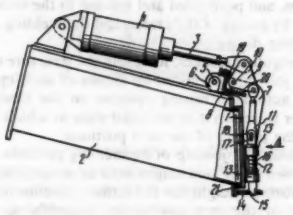
means for pivotally displacing said door relative to the said other portion of said back member to form said chute.

4,547,099

GATE OF THE PIPE-LINE OF A PNEUMATIC CONVEYER

Adolf M. Alexandrov, Moscow; Evgeny F. Bulginov, Moskovskaya; Jury A. Yashin, and Igor V. Kiselev, both of Moscow, all of U.S.S.R., assignors to Spetsialnoe Konstruktorskoe Bjuro "Transprogress", Moscow, U.S.S.R.

PCT No. PCT/SU82/00032, § 371 Date Apr. 13, 1984, § 102(e) Date Apr. 13, 1984, PCT Pub. No. WO84/00947, PCT Pub. Date Mar. 15, 1984
PCT Filed Aug. 31, 1982, Ser. No. 606,837
Int. Cl.[4] B65G *53/58*
U.S. Cl. 406—149 **4 Claims**



1. A gate assembly for a pipeline of a pneumatic conveyor comprising:

a damper pivotally mounted to said pipeline about a damper axle for movement between a closed position so as to close an opening in said pipeline and an open position so as to open said opening;

a drive assembly including a movable link for moving said damper between said open and closed positions;

at least one guide secured to said damper;

a plate having a hole and secured to the pipeline;

a driven pin trip secured to said damper by said at least one guide, and positioned within said hole of said plate when said damper is in the closed position to lock said damper thereat;

a bracket secured to said pipeline;

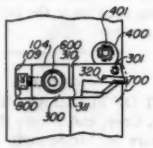
an angular lever pivotally mounted to said bracket parallel to said damper axle in a limited angular range about a lever axle, and pivotally connected to said movable link and said driven pin trip.

4,547,100

ADJUSTABLE MILLING CUTTER

Peter D. Naccarato, and Robert W. Johnson, both of Windsor, Canada, assignors to The Valeron Corporation, Troy, Mich.

Filed Sep. 28, 1983, Ser. No. 536,613
Int. Cl.[4] B26D *1/12*
U.S. Cl. 407—39 **4 Claims**



1. A toolholder for at least one replaceable cutting element, each cutting element having at least one cutting portion, the toolholder comprising:

a body having at least one cavity which opens at a first and

a second surface of the body, the cavity including a bottom surface substantially parallel to said first body surface and a first side surface substantially normal to said bottom surface and projecting to said first and second body surfaces;

cutting element holding means positioned in the cavity and abutting said first side cavity surface, the holding means having a cutting element mounting pocket positioned for receipt of the cutting element such that the cutting portion projects beyond said first body surface, means retaining the cutting element in the mounting pocket, and a slot which opens at a surface of the cutting element holding means adjacent said cavity first side surface remote from the mounting pocket and positioned so as to define a flexible portion of the holding means including the mounting pocket; and

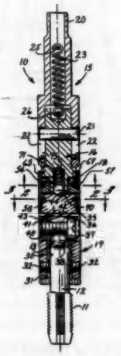
wedge means positioned in the toolholder body adjacent said cavity first side surface, having a wedging surface abutting the flexible portion of the holding means, operative to move the flexible portion about a fulcrum point near an inner terminus of the slot such that the cutting portion of a cutting element placed in the mounting pocket will move along an arcuate path in a plane transverse to that of said first body surface.

4,547,101

SELF-ALIGNING TOOL HOLDER

William J. Dowdakin, Sr., 1019 S. Independence Ave., Rockford, Ill. 61102

Filed Sep. 20, 1983, Ser. No. 533,864
Int. Cl.⁴ B23B *31/00*
U.S. Cl. 408—127 **11 Claims**



1. A self-alining holder for a tool, said holder comprising a spindle member and a holding member, means for connecting a tool to said holding member, and means for non-rotatably coupling said spindle member to said holding member while permitting said holding member to float radially relative to said spindle member, said coupling means comprising a coupling member disposed between said spindle member and said holding member, two slots disposed at right angles to one another and each having open ends, two lugs disposed at right angles to one another and received in said slots with sliding clearance, the ends of said lugs being located adjacent the ends of said slots, one of the complementary slot and lug sets being on one end of said coupling member and on the adjacent end of said spindle member, the other of the complementary slot and lug sets being on the opposite end of said coupling member and on the adjacent end of said holding member,

axially spaced grooves around each of the complementary slot and lug sets, and separate retaining rings within each of said grooves and directly engagable with surfaces of said grooves to captivate said lugs axially in said slots while permitting the lugs to float radially within the slots.

4,547,102

REAMER WITH ANGLED BLADE AND FULL LENGTH CLAMP

Douglas Millington, Sheffield, and Peter W. W. Yewman, Chesterfield, both of England, assignors to Cogsdill Tool Products, Inc., Camden, S.C.

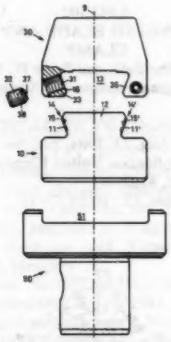
Continuation of Ser. No. 417,399, Sep. 13, 1982, abandoned. This application Aug. 23, 1984, Ser. No. 643,757
Claims priority, application United Kingdom, Nov. 27, 1981, 8135854; Feb. 2, 1982, 8202946
Int. Cl.⁴ B23B *27/16*
U.S. Cl. 408—185 **6 Claims**

1. A reamer comprising a reamer body, a single adjustable, axially-elongated blade with an axially-elongated front cutting face, an axially-elongated outer cutting edge, and an axially-elongated rear planar face thereon parallel to said front cutting face, said blade having a generally trapezoidal lateral cross-section with its front cutting face being wider than its rear planar face, said blade being clamped by a clamping plate in a generally axially-extending slot in the periphery of said reamer body, said clamping plate extending over substantially the axial length of said blade, said slot having a planar positive rake blade supporting face extending generally axially in said slot in said reamer body and being generally parallel to the longitudinal axis of said reamer body, said planar supporting face in said reamer body being generally flatly engaged directly by said axially-elongated rear planar face of blade for slidable adjusting movement of said blade therealong and being disposed in a non-parallel relationship with a radial plane extending through the longitudinal axis of said reamer body and through said outer cutting edge of said cutting face of said blade so that the radial position of said outer cutting edge of said blade is adjustable along a first plane parallel to said planar supporting face and parallel to a second plane extending through the longitudinal axis of said reamer body and disposed at a positive angular relationship relative to said radial plane, said radial position of said outer cutting edge of said blade being adjustable by a pair of screws spaced apart along the reamer body and in threadable engagement therewith, one of said screws abuttingly bearing on said blade at or adjacent each end of the blade, and said clamping plate wedgingly engaging the front cutting face of the blade and clampingly urging said blade into said generally flat direct engagement of said rear planar face with said planar supporting face in said reamer body in order to maintain said outer cutting edge in an accurate radial position and in an accurate and constant positive rake angular relationship with said reamer body regardless of the radial position of said outer cutting edge.

4,547,103
BORING TOOL

Dieter Pape, Rümlang, and Hans Woerz, Oberhasli, both of Switzerland, assignors to Heinz Kaiser AG, Rumlang, Switzerland

Filed Jun. 24, 1983, Ser. No. 507,520
Claims priority, application Switzerland, Jun. 28, 1982, 3955/82
Int. Cl.⁴ B23B 29/08
U.S. Cl. 408—197 8 Claims

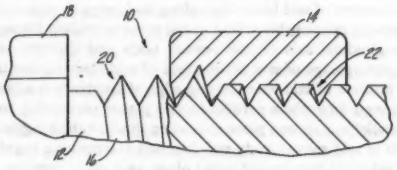


1. A boring tool for boring bore holes, having an insert upon which one or two boring heads are guided transverse to the tool axis by means of a swallowtail track and are fixedly positionable by set screws, wherein the swallowtail projection of the track has a recess on both of its lateral sliding surfaces, said recess deepening toward the tool axis, and wherein the set screws are adapted to bear against clamping surfaces located within the recesses in order to produce fixed positioning of the boring heads.

4,547,104
TAP

Horace D. Holmes, 28576 Green Willow, Farmington Hills, Mich. 48024

Division of Ser. No. 258,221, Apr. 27, 1981,. This application Jul. 21, 1983, Ser. No. 515,783
Int. Cl.⁴ B23G 5/06
U.S. Cl. 408—220 3 Claims



1. A tool for forming a female thread, comprising:

an elongate body having a pilot end and working length, the working length including the first portion proximate the pilot end and having a helical male thread formed thereon, said male thread being defined by leading and trailing flanks converging radially outward from the longitudinal axis of said body at respective first and second angles of inclination relative to a line normal to said longitudinal axis and forming a thread crest,

said thread crest being truncated to define a flat at the outer periphery of said thread crest, said flat extending transversely between said leading and trailing flanks and parallel to said longitudinal axis,

said first angle being less in magnitude than said second angle, the leading flank being inclined relative to said longitudinal axis at an angle greater than the corresponding flank of a standard thread form of substantially identical pitch and diameter, said trailing flank being inclined relative to said longitudinal axis at an angle which is substantially the same as the corresponding flanks of said standard thread form,

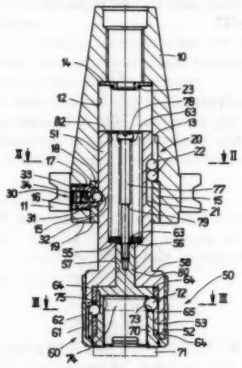
the working length further having a second portion proximate the first portion but remote from the pilot end also having a helical male thread formed thereon and being defined by leading and trailing flanks lying at said respective first and second angles of inclination relative to said longitudinal axis but rising to a radial height which is substantially greater than that of the truncated crest of said first portion,

whereby turning said tap into a female fastener body results in a female thread form having first and second portions of common root radius but differing thread depths.

4,547,105
QUICK-CHANGE CHUCK

Lothar Höfle, Ostfildern, and Veit Autenrieth, Dettingen/Teck, both of Fed. Rep. of Germany, assignors to Reiner Bilz and Axel Bilz, both of Ostfildern, Fed. Rep. of Germany

Filed May 16, 1984, Ser. No. 610,874
Int. Cl.⁴ B23G 3/00
U.S. Cl. 408—141 22 Claims



1. In a quick-change for a thread cutting tool, comprising a spindle-receiving member (10) for receiving a spindle connected to a machine tool and having a central axis and a free end; a chuck head (50) connected to said free end and having a cylindrical opening (53) axially aligned with said spindle-receiving member; a casing (70) inserted in said opening and releasably coupled with said chuck head; a quick-change insert (71) for holding a thread cutting tool and insertable in said casing, said insert being formed with a peripheral circular groove (74); at least one holding ball (72) engaged in said circular groove, said insert being held in said casing and axially coupled with said casing by said holding ball; means for an axial compensation for a difference between a spindle stroke and a pitch of the thread of the thread cutting tool and positioned between said spindle-receiving member and said casing; at least one return spring (23) positioned between said spindle-receiving member and said chuck head, said axial compensation means enabling an axial displacement of said spindle-receiving member relative to said casing in both axial directions under an extension or contraction against the action of said return spring; and torque-transmitting means for transmit-

ting torque from said chuck head to said casing and including torque-transmitting balls, said casing having at least one axial groove receiving said torque-transmitting balls, the improvement comprising said axial compensating means including a compression-compensating device (20) which compensates for a compression force exerted on the chuck during said displacement and directed towards said spindle-receiving member, and an independent tension-compensating device (60) which compensates for a tension force exerted on the chuck during said displacement and directed away from said spindle-receiving member.

4,547,106
GROUND ANCHORS
Yitshaq Lipsker, 24 Trumpeldor St., Ramat Hasharon, Israel
Filed Mar. 15, 1983, Ser. No. 475,503
Int. Cl.⁴ E21D *20/00*
U.S. Cl. 405—259 **7 Claims**

1. A ground element of a ground anchor characterised by being formed by a crosswise expandable structure which comprises an axially extending shaft having a first end and a second end a series of interconnected four bar linkages extending in the axial direction of and hingedly connected to said shaft, the size of each linkage in the series being greater than that of the preceding one extending in the direction from the first end toward the second end with the largest linkage located closer to the first end, two bars of each said linkage being common to it and to the adjacent said linkage, at least two pressure plates extending generally in the axial direction of said shaft and being spaced laterally apart and forming a space therebetween, all said linkages being located within the space between said at least two pressure plates which are laterally movable relative to the shaft and extend within the range of the expanding four bar linkages, means provided for expanding the linkages crosswise relative to the shaft.

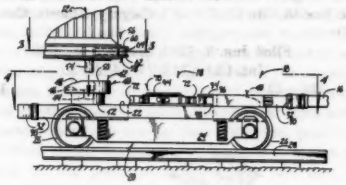
4,547,107
INTERMODAL RAIL TRUCK AND COUPLING SYSTEM
Robert A. Krause, 3300 Woodland, Ames, Iowa 50010
Continuation-in-part of Ser. No. 303,718, Sep. 21, 1981, abandoned, which is a continuation-in-part of Ser. No. 234,647, Feb. 17, 1981, Pat. No. 4,416,571. This application Mar. 16, 1984, Ser. No. 590,210
Int. Cl.⁴ B60F *1/04*
U.S. Cl. 410—58 **24 Claims**

1. An intermodal rail truck and coupling means for adjoining two containers, wherein each said container is from the set comprised of an intermodal container and a conventional rail car, said intermodal rail truck and coupling means maintaining a uniform load line between said two adjoined containers, comprising:

a rail truck frame member having a top surface and a longitudinal axis generally parallel to said load line;

wheel supports on said frame member to secure rotatable rail wheels for operation on conventional railroad rails;

first coupler means at opposite end of said frame member being movable into alignment with said load line generallly parallel to said longitudinal axis for coupling with conventional couplers on conventional rail cars;

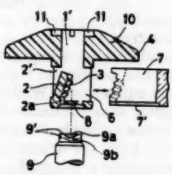


power means operatively connected to said frame member for moving said first coupler means out of said load line when not used for coupling with conventional rail cars;

first intermodal connection means on said frame member along said longitudinal axis for receipt and operative securing retainment of second intermodal connection means on said intermodal container along said load line; and

linkage means for releasably linking said two containers generally parallel to said longitudinal axis at a unifrom height equaling that of said load line of conventional rail cars.

4,547,108
TRIM COVER CLIP
Daiji Nakama, Chigasaki, Japan, assignor to Nifco Inc., Yokohama, Japan
Filed Nov. 25, 1983, Ser. No. 555,120
Int. Cl.⁴ F16B *19/00*
U.S. Cl. 411—374 **3 Claims**



1. A trim cover clip of a plastic formed in a mold comprising a hollow tube, containing in the wall of said hollow tube at least one slit having the shape of three sides of a rectangle and thereby enclosing therein an engaging piece possessing an attached end and a free end, and having the inner wall of said engaging piece corrugated to form teeth at least some of which are axially spaced from said free end toward adjacency with the attached end, said teeth being capable of engaging with a thread on a bolt being passed through the inner hole of said hollow tube from adjacent the attached end to the free end thereof, said teeth on the inner wall of said engaging piece being helically formed at the same pitch as said thread on said bolt, said engaging piece being formed inwardly aslant relative to the outer wall of said hollow tube so as to have the free end thereof positioned deeply into the inner hole of said tube and substantially completely inwardly of said outer wall for bolt engagement substantially throughout the extent of said engag-

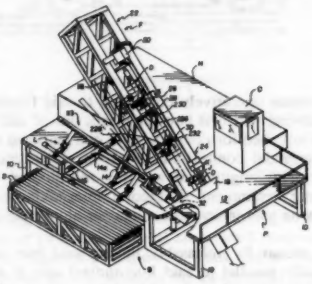
ing piece; and a forming tool accommodating aperture means in the wall of said tube diametrically opposite said engaging piece and at least coextensive with the toothed face of the engaging piece for enabling removal of a part of a tool for forming said engaging piece during molding.

4,547,109

DRILL PIPE HANDLING AND PLACEMENT APPARATUS

Horace J. Young, #2402, 924 - 7th Ave. SW., Calgary, Alberta, Canada T2P 1A4; Robert F. Becker, 327 Silver Valley Rise NW., Calgary, Alberta, Canada T3B 4B1, and Brian C. Will, P.O. Box 48, Site 17, R.R. #2, Calgary, Alberta, Canada (T2P 2G5)

Filed Jun. 8, 1983, Ser. No. 502,088
Int. Cl.[4] E21B *19/14, 19/20*
U.S. Cl. 414—22 **19 Claims**



1. A drill pipe lifting and placement apparatus, comprising:
(a) a platform;
(b) an angularly disposable drilling frame having a longitudinal drilling frame axis and being pivotably connected to said platform for movement generally in a first plane and having means for holding a length of drill pipe;
(c) an angularly displaceable member pivotably connected to said platform for movement generally in a second plane generally parallel to and spaced from said first plane and having a longitudinal loading axis capable of being positioned parallel to said drilling frame axis and adjacent thereto for permitting transfer of drill pipe between said member and said frame;
(d) means for angularly displacing said member from a first position to a second position in substantial alignment with and substantially adjacent said holding means;
(e) drill pipe gripping means connected to said member;
(f) said gripping means rotatable about said longitudinal axis of said member from a first pre-determined position to a second pre-determined position substantially aligned with said holding means;
(g) means for rotating said gripping means; and,
(h) drive means associated with said gripping means for causing said gripping means to grip and release said drill pipe.

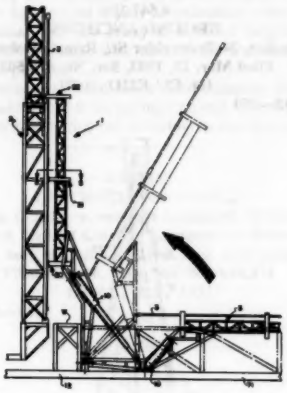
4,547,110

OIL WELL DRILLING RIG ASSEMBLY AND APPARATUS THEREFOR

Alvin L. Davidson, Taber, Canada, assignor to Guy E. Lane, Medicine Hat, Canada

Filed May 3, 1983, Ser. No. 491,096
Int. Cl.[4] E21B *19/14*
U.S. Cl. 414—22 **2 Claims**

1. An improved oil well drilling rig assembly including:
(a) a main drilling mast having a base and an upper structure, said upper structure being adapted to receive sections of drill pipe;
(b) a pipe supply mast adapted to releasably hold a section of drill pipe, said supply mast having upper, intermediate and lower sections, said lower section being pivotally mounted in a spaced relationship from the base of the main mast for movement between a horizontal pipe receiving position and a raised pipe discharge position; in which the pipe supply mast includes self-alignment means for transversely aligning said supply mast with the main drilling mast when said supply mast is in a raised pipe discharge position, said self-alignment means includes a plate mounted on the supply mast having a pair of angled surfaces formed at opposite edges of the plate; and in which



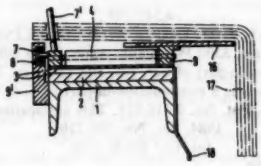
said plate angled surfaces are adapted to slidably engage complementary angled surfaces provided on the main mast to transversely align said masts;
(c) storage rack means for holding a plurality of drill pipe sections; and
(d) pipe dispensing means operatively communicating with the pipe supply mast and storage rack means for individually dispensing a pipe section onto the upper section of the pipe supply mast when said supply mast is in horizontal position for subsequent delivery by the supply mast to the upper structure of the main drilling mast.

4,547,111

APPARATUS FOR STACKING FLAT ARTICLES

Fritz Achelpohl, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Jun. 2, 1983, Ser. No. 500,352
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1982, 3221243
Int. Cl.[4] B65G *17/16*
U.S. Cl. 414—27 **4 Claims**



1. Intermittently operating stacking and carrying apparatus for bags that have been supplied by a bag machine and collected into stacks, said apparatus comprising:

an endless conveying means that circulates over guide wheels;

locating means on the conveying means for receiving and positioning a plurality of bags, the locating means cooperable with holes punched out of the bags and for mounting and supporting a stack of bags;

plate support means carried on said conveying means and spaced from and opposite said locating means;

supporting plates carried on the plate support means, the supporting plates pivotable about an axis extending in the direction of movement of the conveying means and positioned inwardly of the edge of the conveying means, the supporting plates extending partially over the conveying means and projecting laterally beyond an edge thereof; and

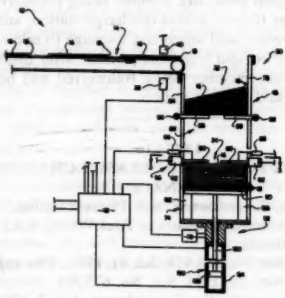
interconnecting means extending across the conveying means for directly interconnecting the locating means with the plate support means, the interconnecting means including pivot shafts having their axes extending transversely to the direction of movement of the conveying means and spaced longitudinally from each other at a distance sufficient to permit them to pass over the guide wheels of the conveying means.

4,547,112

SIGNATURE HANDLING APPARATUS

Horst K. Steinhart, Westminster, Calif., assignor to Rima Enterprises, Huntington Beach, Calif.

Filed Jan. 20, 1984, Ser. No. 572,581
Int. Cl.[4] B65G *57/06*
U.S. Cl. 414—31 **21 Claims**



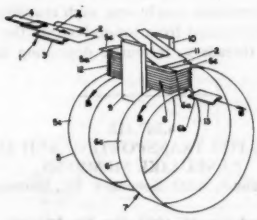
8. An apparatus for use in stacking signatures having four linear edge portions which intersect at four corners of the signatures with one edge portion thicker than other edge portions and compensating for the thickness of the one edge portion by compressing the one edge portion and offsetting successive groups of signatures in a stack of the signatures, said apparatus comprising platform means for receiving signatures in an initial spatial orientation, first drive means for rotating said platform means through a predetermined arcuate distance about a vertical axis to offset a first group of signatures from the initial spatial orientation so that a second group of signatures subsequently received on said platform means have their one edge portion offset from the one edge portion of signatures in the first group of signatures, a plurality of compression members, motor means for moving said compression members from retracted positions to extended positions extending over said platform means and for moving said compression members from their extended positions to their retracted positions, said motor means and plurality of compression members being connected with said platform means for rotation therewith under the influence of said first drive means, said plurality of compression members including first and second compression members which extend across edge portions of the first group of signatures at locations adjacent to the one edge portion when said first and second compression members are in their extended positions over the first group of signatures and third and fourth compression members which extend across edge portions of the first group of signatures at locations adjacent to an edge portion opposite from the one edge portion when said third and fourth compression members are in their extended positions over said first group of signatures, said first and second compression members extending across said second group of signatures at locations adjacent to the edge portion opposite from the one edge portion of the signatures of the second group of signatures when the second group of signatures is disposed on top of the first group of signatures and said first and second compression members are in their extended positions, said third and fourth compression members extending across said second group of signatures at locations adjacent to the one edge portion of the signatures of the second group of signatures when the second group of signatures is disposed on top of the first group of signatures and said third and fourth compression members are in their extended positions, and second drive means for raising said platform means to press signatures on said platform means against said first, second, third and fourth compression members when said compression members are in their extended positions to compress the signatures on said platform means adjacent to the one edge portion and the edge portion opposite from the one edge portion of the signatures.

4,547,113

CONTINUOUS MOTION SPIRAL STACKER

David P. Welch, Cincinnati, and David R. Bennett, Fairfield, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 19, 1984, Ser. No. 622,216
Int. Cl.[4] B65H *31/10, 31/30*
U.S. Cl. 414—49 **31 Claims**

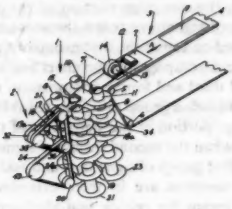


1. A stacker for accumulating generally flat products of substantially the same size and shape into stacks of specific count, said stacker comprising at least one vertically oriented spiral element having a horizontally oriented axis of rotation, said spiral element also having an exterior leading edge, an interior trailing edge and an exterior product supporting surface extending therebetween, a stack-building area, means to rotate said spiral element about its axis of rotation at a predetermined rate with said leading edge, said product support surface and said trailing edge passing through said stack-building area, an infeed device to continuously feed products to said stack-building area, such that as said spiral element rotates therethrough, said products are accumulated in a stack on said product support surface and means to retain said stacked products in said stack-building area until discharged from said product support surface of said spiral element by said trailing edge of said spiral element after each revolution of said spiral element.

4,547,114
POSITIVE CONTROL STACKER

Howard N. Watrous, West Chester; Walter Cash, Jr., and Weldon R. Dixon, both of Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sep. 29, 1982, Ser. No. 428,319
Int. Cl.[4] B65H *29/42*
U.S. Cl. 414—81 26 Claims

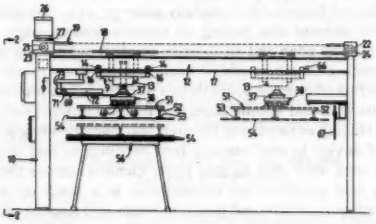


1. A stacker for rigid and flexible sheet and pad-like products forming individual stacks thereof of specific count, said stacker comprising at least one pair of stacker screws, each stacker screw having at least two helical threads, each thread having a starting edge and a terminating edge, all of said terminating edges of said screw being below all of said starting edges, said stacker screws of said at least one pair having the same number of threads and being mirror images of each other, said stacker screws rotating at the same speed and in opposite directions, said stacker screws being so radially aligned that corresponding threads thereof occupy corresponding positions, said stacker screws of said at least one pair being arranged in side-by-side relationship with their corresponding threads opposed, means to continuously feed products between said screws onto said starting edges of said helical threads of said at least one pair such that each product is supported by corresponding threads of said screws, said corresponding threads being so configured that each of said products is shifted downwardly thereby, said corresponding threads of said screws of said at least one pair terminate one-by-one such that a stack of said products is accumulated from top-to-bottom, the last of said corresponding threads to terminate depositing said product stack.

4,547,115
APPARATUS FOR TRANSPORTING AND ALIGNING PANEL-LIKE MEMBERS

Carl D. Charbonnet, 4323 Kennesaw Dr., Birmingham, Ala. 35213

Filed Jan. 25, 1984, Ser. No. 573,849
Int. Cl.[4] B65G *59/04*
U.S. Cl. 414—121 14 Claims



1. In apparatus for sequentially transferring and aligning panel-like members,

(a) a pick-up station supporting a stack of panel-like members to be sequentially transferred and aligned,

(b) a discharge station for receiving said panel-like members after transfer and alignment thereof,

(c) a primary carriage mounted for linear movement selectively to said pick-up station and to a position adjacent said discharge station,

(d) at least one extensible secondary carriage carried by said primary carriage and rotatable about a vertical axis selectively to a transport position and to an aligned position and being movable linearly relative to said primary carriage selectively to an extended position and to a retracted position,

(e) a pick-up head carried by said secondary carriage and adapted for rotation therewith,

(f) means to move said secondary carriage and the pick-up head carried thereby in a vertical direction selectively to an upper transport position and to a lower pick-up and discharge position,

(g) means to stop linear movement of said primary carriage prior to its reaching said discharge station, with said secondary carriage being movable toward said extended position after movement of said primary carriage is stopped,

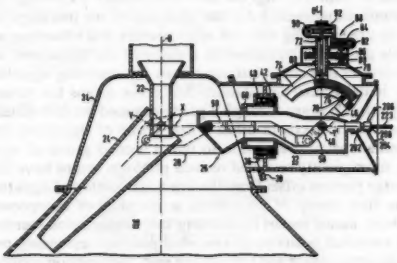
(h) alignment stop means at said discharge station in position to engage at least one edge of said panel-like member as it is transferred in response to movement of said secondary carriage to said extended position to impart rotation to said panel-like member being transferred and its secondary carriage about said vertical axis from said transport position to said aligned position and to correctly position at least one edge of said panel-like member and thus align any misaligned panel-like member being transferred prior to discharge thereof at said discharge station, and

(i) means to return said secondary carriage to said retracted position and to said transport position after discharge of said panel-like member being transferred and before returning to said pick-up station.

4,547,116
APPARATUS FOR CONTROLLABLY CHARGING A FURNACE

Edouard Legille, Luxembourg, and Pierre Mailliet, Howald, both of Luxembourg, assignors to Paul Wurth, S.A., Luxembourg, Luxembourg

Continuation of Ser. No. 288,974, Jul. 31, 1981,. This application Nov. 26, 1984, Ser. No. 675,301
Claims priority, application Luxembourg, Apr. 3, 1981, 83280
Int. Cl.[4] F27B *1/20*
U.S. Cl. 414—160 21 Claims



1. In apparatus for use in the charging of a shaft furnace, the furnace being provided with an internally mounted steerable tubular member for guiding downwardly flowing charge material so as to cause the material to fall on the furnace hearth in accordance with a desired pattern, the tubular member defin-

ing a first longitudinal axis, the furnace also including a vertically oriented feed channel by which the charge material is delivered under the influence of gravity to the upper end of said steerable tubular member, an improved apparatus for steering the tubular member comprising:

suspension fork means for supporting the tubular member, said fork means being rotatably supported in a wall of said furnace, said fork means including an elongated body portion defining a second longitudinal axis, said fork means further including at least a first pair of parallel branches extending from one end of said body portion;

said suspension fork means being a hermetically sealed tubular housing adapted to allow cooling and lubricating fluid the flow throughout the interior of said tubular housing and thereby cool and lubricate any moving components located therein;

means for pivotally mounting the tubular member adjacent a first end thereof between said branches of said suspension fork means, said mounting means defining a third axis about which the tubular member may pivot, said third axis being transverse to the first longitudinal axis of the tubular member;

control means, said control means being positioned exterior of the enclosure, said control means defining a fourth longitudinal axis;

pivot means, said pivot means including a rotatable shaft which is engaged by said control means adjacent a first end of said control means, said pivot means shaft defining a fifth axis which is transverse to said fourth axis;

means for imparting motion to said control means at a point displaced from said pivot means to cause said fourth longitudinal axis of said control means to undergo a pattern of movement which it is desired to have the first longitudinal axis of the tubular member follow;

motion transmission means for coupling rotational motion of said control means fourth axis about said pivot means shaft defined fifth axis to the tubular member to thereby cause the tubular member to rotate about said third axis, said motion transmission means being enclosed within said body portion and said parallel branches of said fork means; and

means connecting said pivot means to said fork means whereby rotation of said control means fourth axis about a point of intersection of said fourth and fifth axes is converted into rotation of said fork means about said second longitudinal axis and simultaneous rotation of the tubular member with said means for pivotally mounting the tubular member.

4,547,117

NUCLEAR FUEL ROD BUNDLE DRIVE APPARATUS

Edward P. Shields, and Elmer A. Bassler, Jr., both of North Huntingdon Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 23, 1983, Ser. No. 535,082
Int. Cl.[4] G21C *19/36*
U.S. Cl. 414—404 **12 Claims**

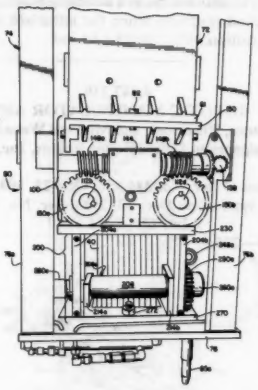
1. Apparatus for transferring a bundle of nuclear fuel rods along a path from a first container to a second container, the second container to be aligned with and disposed beneath the first container, said rod transferring apparatus disposed at the bottom of the first container, said rod transferring apparatus comprising:

(a) a set of rollers, each roller having its axis, said rollers being mounted to permit the distance between the axes of the rollers to be varied from a first distance, whereat space between the rollers is sufficient for receiving the bundle of fuel rods to a second distance, less than said first distance, whereat said rollers engage opposing sides of the bundle of nuclear fuel rods;

(b) a hatch disposable between a first position intercepting said path and retaining the bundle of fuel rods within the first container, and a second position permitting the bundle of nuclear fuel rods to be transferred from the first container to the second container;

(c) drive means coupled with each of said set of rollers for rotatably driving said rollers in opposite directions;

(d) actuatable means for disposing said hatch from its first position to its second position; and



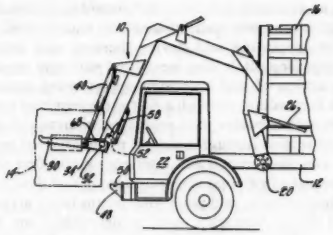
(e) actuatable means for disposing said rollers of said set said second distance apart to permit said rollers to engage and to be rotatably driven by said drive means to move the bundle of nuclear fuel rods from the first container to the second container.

4,547,118

FRONT END LOADER

Francis H. Pittenger, Shelby, Ohio, assignor to Peabody International Corp., Stanford, Conn.

Filed Feb. 9, 1983, Ser. No. 464,780
Int. Cl.[4] B65F *3/04*
U.S. Cl. 414—408 **6 Claims**



1. A front end loader mechanism for a motor vehicle comprising: a pair of lift arms pivotally mounted on the vehicle, means for swinging said lift arms about said pivot from a lower transport position at the front of said vehicle through an intermediate loading position and to an elevated unloading position at the top of said vehicle, a pair of fork arms mounted on said lift arms, means for swinging said fork arms between first and second fork arm positions which are substantially a horizontal and a vertical position relative to said lift arms when the latter are in said lower transport position, and cam means on said lift arms movable relative thereto and relative to said fork arms, and actuator means for moving said cam means from a first cam position when said lift arms in said transport position to permit swinging movement of said fork arms from said first fork arm position to said second vertical transport fork arm

position, said actuator means moving said cam means to a second cam position permitting swinging movement of said fork arms relative to said lift arms upon movement of the latter from said transport position toward said unloading position, said cam means being in said second cam position to limit the angular position of said fork arms relative to said lift arms by abutment of a stop surface on said cam means with the means for swinging said fork arms to a dumping position between said first and second positions when the latter are in said elevated unloading position.

4,547,119

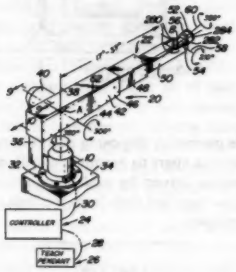
ROBOTIC MANIPULATOR ARM

Peter E. Chance, Rosemont, and Mitchell Weiss, Ardmore, both of Pa., assignors to United States Robots, Inc., King of Prussia, Pa.

Continuation of Ser. No. 314,156, Oct. 23, 1981, abandoned. This application Dec. 30, 1983, Ser. No. 567,136

Int. Cl.[4] B25J *9/00*

U.S. Cl. 414—735 **30 Claims**



1. In a robotic system a manipulator for moving a device to a predetermined point within a working volume under control of microprocessor based control means comprising base joint means including a rotatable section, a first section extending from said rotatable section and being fixed against rotation relative thereto, shoulder joint means, a second section extending along an extension axis from said shoulder joint means and wrist joint means mounted adjacent an end of said second section for supporting said device thereon, said wrist joint means comprising pitch joint means and roll joint means, said rotatable section of said base joint means being arranged to pivot said first section through a first predetermined arc about a first axis, said shoulder joint means being arranged to pivot said second section through a second predetermined arc about a second axis, said second axis intersecting said first axis perpendicularly at a first point at all positions of said device within said working volume, said pitch joint means being arranged to pivot said device through a third predetermined arc about a third axis, said roll joint means being arranged to pivot said device through a fourth predetermined arc about a fourth axis, said fourth axis intersecting said third axis perpendicularly at a second point, said third axis and said second axis being disposed parallel to each other, said first and second points lying along said extension axis.

4,547,120

MANIPULATOR ROBOT

Herman E. Turner, Jr., Elyria, and Jan L. Shanaberger, Avon Lake, both of Ohio, assignors to Nordson Corporation, Amherst, Ohio

Filed Oct. 7, 1983, Ser. No. 539,923

Int. Cl.[4] B25J *9/00*

U.S. Cl. 414—744 R **5 Claims**

1. A manipulator robot comprising:

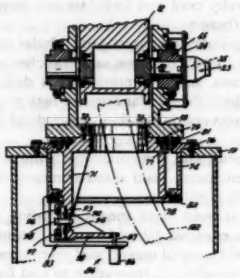
a generally hollow base having a top surface with an aperture therethrough;

a turret assembly extending into, and rotatably received on, the base for rotation aboout a generally vertical axis, the turret assembly having an aperture therethrough at least partially coincident with the aperture in the upper surface of the base, said vertical axis passing through both said apertures;

a first arm rotatably mounted on the turret assembly;

a second arm rotatably mounted on the first arm;

an angular position transducer, in line with said vertical axis, having a housing portion and a shaft portion rotatable within the housing portion; and



means for mounting the angular position transducer inside the base spaced below the apertures in the top surface of the base and the turret assembly, including a first L-shaped support extending downwardly and radially inwardly from the turret assembly to couple one of said transducer portions to the turret assembly and a second L-shaped support extending downwardly and radially inwardly from the base to couple the other said transducer portion to the base, whereby rotation of the turret assembly relative to the base rotates the shaft portion of the transducer relative to the housing portion while permitting the passage of cables or the like above the angular position transducer, adjacent said first and second L-shaped supports, and through both said apertures.

4,547,121

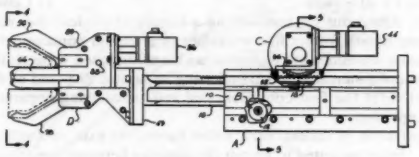
SELF-LOCKING TELESCOPING MANIPULATOR ARM

Malcolm F. Nesmith, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 30, 1983, Ser. No. 537,757

Int. Cl.[4] B25J *15/00*

U.S. Cl. 414—753 **18 Claims**



1. A mechanical telescoping manipulator arm for grasping and maneuvering an object comprising:

(a) a main housing adapted to be fixed to an associated structure;

(b) a telescoping arm slidably carried by the housing;

(c) a pivoting finger assembly carried on a free end of said telescoping arm which includes:

(i) an assembly housing,
(ii) a plurality of pivot shafts carried by said assembly housing,
(iii) a pivoting finger carried on each pivot shaft having gear teeth carried on an arcuate portion thereof,
(iv) a rack gear slidably carried by said assembly housing having a plurality of toothed racks with gear teeth formed thereon meshing with the gear teeth of respective ones of said pivoting fingers,
(v) a driven shaft carried by said assembly housing,
(vi) a drive wheel carried on said driven shaft having a drive gear meshing directly with gear teeth of said toothed racks,
(vii) a worm gear carried on said driven shaft,
(viii) a drive motor carried by said assembly housing having a worm drive shaft meshing directly with said worm gear, and
(ix) said worm drive shaft being carried by said assembly housing perpendicular to said driven shaft and said pivot shafts to provide a ninety-degree self-locking drive limiting movement between said motor drive shaft, said driven shaft, and said rack gear to positively lock and hold said fingers in a pivot position and thereby firmly grip an object held by said fingers;

(d) drive means connected to said telescoping arm for reciprocating said arm to and fro relatively to said main housing; and

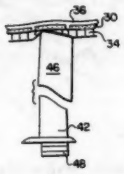
(e) means for mounting said main housing to an associated structure.

4,547,122

METHOD OF CONTAINING FRACTURED TURBINE BLADE FRAGMENTS

John W. Leech, Bethesda, Md., assignor to Aeronautical Research Associates of Princeton, Inc., McLean, Va.

Filed Oct. 14, 1983, Ser. No. 541,937
Int. Cl.[4] F01D *21/04*
U.S. Cl. 415—9 **3 Claims**



1. A containment ring for turbine engine housings comprising:

(A) an integral honeycomb structure encircling the turbine engine, so as to impede the motion of centrifugally propelled blade fragments;

(B) an intermediate web of subdivided compartments fitted upon the exterior of said honeycomb as a resistance against blade fragment penetration;

(C) a plurality of ceramic blocks confined as independent energy absorbers within said subdivided compartments, so as to blunt and fracture blade fragments, and

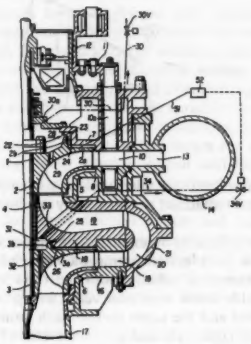
(D) an outer shielding shell structurally continuous with said intermediate web, so as to confine said ceramic blocks, said outer shell having a bending stiffness adequate to provide support for said ceramic blocks as energy absorbers.

4,547,123

MULTI-STAGE HYDRAULIC MACHINE AND METHOD OF OPERATING SAME

Kentaro Ichikawa, Chigasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Division of Ser. No. 199,628, Oct. 22, 1980, Pat. No. 4,406,577.
This application May 19, 1983, Ser. No. 495,945
Claims priority, application Japan, Oct. 29, 1979, 54-139518; May 30, 1980, 55-72470
Int. Cl.[4] F03B *15/04*
U.S. Cl. 415—24 **18 Claims**

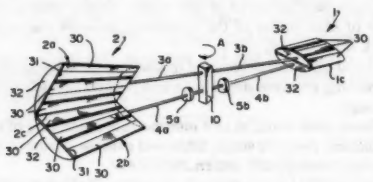


1. In an improved multi-stage hydraulic machine including:
a plurality of runners, each having a runner crown;
a plurality of runner housings for housing each of said plurality of runners, respectively,
each of said runner housings being connected to said runner housing of a next stage thereof through a return path;
a main shaft for supporting each of said plurality of runners of said machine,
a head cover positioned above said runner of a highest pressure stage;
an intermediate speed ring provided between said runner housing and said runner housing of the next stage thereof, each said intermediate speed ring containing one said return path and having at least one return vane; and
first means for exhausting the air in said runner housing of said highest pressure stage;
an improvement comprising:
movable guide vanes positioned outside of said runner housing of the highest pressure stage;
second means for exhausting the air in said runner housing of remaining pressure stages other than said highest pressure stage, each of said second means including:
an exhaust passage bored in said runner crown from a water side of said runner of the remaining pressure stages to a back side thereof,
an exhaust chamber positioned in said runner housing of the remaining pressure stages at an exit portion of said exhaust passage,
an exhaust path bored in said intermediate speed ring of said remaining pressure stages from said exhaust chamber, and passing through said return vane,
means connected to an output portion of said exhaust path of said remaining pressure stages for exhausting the air in said exhaust chamber of the remaining pressure stages to the outside of said machine; and
means for sealing water being positioned in said runner housing of the remaining pressure stages at a radially exterior portion of said exhaust chamber.

4,547,124
IMPELLER FOR A WIND MOTOR
Vladimir Kliatzkin, 1 Rav Joseph Mashash St., Kiryat-Yam; Joseph Krimerman, 22 Keren Hayessod St., Haifa, and Eliezer Mayraz, 3, Dafna St., Haifa 34371, all of Israel
Filed Apr. 11, 1983, Ser. No. 483,899
Claims priority, application Israel, Apr. 11, 1982, 65465
Int. Cl.⁴ F03D *1/06*
U.S. Cl. 416—86 **11 Claims**

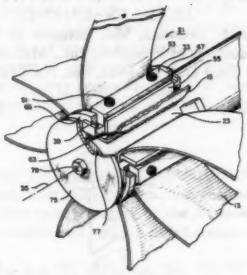
1. An impeller for a wind motor, said impeller comprising:
a rigid hub attached to a rotatably mounted shaft of a wind motor,
a hollow inflatable outer rim in the shape of a torus and made from a flexible, non-permeable material,
vanes extending radially from the rigid hub to the hollow inflatable outer rim, said vanes being made of a flexible material and the inner end of each vane being connected to said rigid hub and the outer end of each vane being connected to said hollow inflatable outer rim, said vanes being bent in a rearward direction when subjected to wind forces,
means for maintaining the torus shape of the hollow inflatable rim when the hollow inflatable outer rim is under the stress of wind forces for stretching and pretensioning said vanes to concentrically position the hollow inflatable outer rim around said rigid hub, and
said hollow inflatable outer rim brakes its speed of revolution to a safe margin of stress when said hollow inflatable outer rim is directed into the direction of the wind forces driving said hollow inflatable outer rim rearwardly of said rigid hub a distance dependent on the wind velocity to stretch and reinforce said vanes without deforming said hollow inflatable rim.

4,547,125
WIND TURBINE
Elihu H. McMahon, II, 1870 Schieffelin Ave., Bronx, N.Y. 10466
Filed Dec. 15, 1983, Ser. No. 561,949
Int. Cl.⁴ F03D *3/06*
U.S. Cl. 416—117 **1 Claim**



1. A wind turbine, having
(a) at least one pair of sail means, each said sail means being in the shape of an airfoil and having upper and lower portions hingedly connected together to permit said portions to move away from and towards each other to thus open and close, respectively, each of said upper and lower portions having slots formed therein, said slots extending transversely of the direction of the wind when a said sail means is disposed facing toward or away from the wind;
(b) a vertical shaft;
(c) a support;
(d) means mounting said vertical shaft in said support for rotation about the vertical axis of said shaft;
(e) means mounting said sail means to said vertical shaft such that said sail means is disposed to move under the action of the wind in a plane about said vertical axis; and
(f) said mounting means for said sail means including operating means for opening and closing one sail means of each pair of sail means while the other sail means of said pair is closed and opened, respectively, as said sail means moves about said vertical axis in said plane, said mounting means for said sail means being operable to dispose said plane at a predetermined angle to the horizontal and being adjustable to change said angle as desired.

4,547,126
FAN IMPELLER WITH FLEXIBLE BLADES
Samuel G. Jackson, P.O. Box 16587, Lubbock, Tex. 79490
Filed Dec. 8, 1983, Ser. No. 559,910
Int. Cl.⁴ F04D *29/24*
U.S. Cl. 416—132 A **6 Claims**



1. A fan impeller with flexible blades, being rotatable to move a stream of fluid, comprising:
a plurality of pieces of unpierced, flexible belting, each of said pieces of belting having a width, a length normally greater than said width, and oppositely disposed free ends, and said pieces of belting each having a central portion located mid-way between said free ends;
a central rotating means having a plurality of depressions for receiving a central portion of said belting pieces;
a plurality of elongate clamping members, spaced radially from said depressions for forming belt receiving openings;
a plurality of tensioning members which act upon said elongate clamping members to urge said belting central portions into said depressions;
a plurality of elongate support members against which said tensioning members react; and
a retaining plate at each end of said elongate support members to radially restrain said support members.

4,547,127

WING MOUNTING FOR A ROTARY WING AIRCRAFT

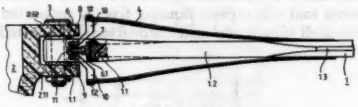
Hubert Frommlet, Hoehenkirchen, and Michael Hahn, Ottobrunn, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Oct. 24, 1983, Ser. No. 544,563

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1982, 3241754

Int. Cl.[4] B64C *27/38*

U.S. Cl. 416—134 A 4 Claims



1. A wing mounting for a rotary wing aircraft, comprising a rotor head including a rotor and a number of blades secured to said rotor head, each blade having a longitudinal blade axis extending substantially radially relative to said rotor head, each blade including a radially outer wing section, a radially intermediate torsion yielding neck section, a radially inner blade root section having a recess (5) therein, and a sleeve bridging said neck section for blade angle adjustments, said sleeve being rigidly connected with its radially outer end to a radially inner end of said wing section, means operatively connecting said blade root section to said rotor head, and pivot means operatively located in said recess (5) for universally joining a radially inner end of said sleeve to a radially inner end of said blade root section, said pivot means comprising socket means, ball means operatively held in said socket means, and means operatively mounting said ball and socket means between said radially inner end of said sleeve and said blade root section, said mounting means including a stud having a longitudinal stud axis substantially coinciding with said longitudinal blade axis, said ball means being arranged for axially sliding on said stud reaching into said socket means for permitting a universal movement between said radially inner end of said sleeve and said blade root section.

4,547,128

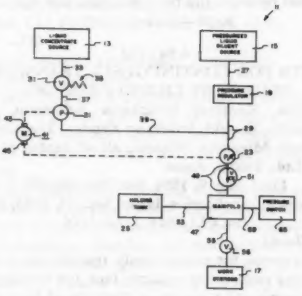
PROPORTIONAL MIXING MEANS

John W. Hayes, 111 Colonial Dr., Cleveland, Miss. 38732

Filed May 7, 1984, Ser. No. 607,973

Int. Cl.[4] F04B *41/06, 49/00;* B67D *5/52*

U.S. Cl. 417—2 4 Claims



1. Proportional mixing means for mixing a liquid concentrate from a liquid concentrate source and a liquid diluent from a pressurized liquid diluent source to form a liquid dilution of a desired proportion and for delivering the liquid dilution to a work station, said mixing means comprising:

(a) pressure regulator means for maintaining the pressure of the liquid diluent at a constant pressure;

(b) constant volume pump means for pumping a constant volume of the liquid concentrate from the liquid concentrate source;

(c) variable volume pump means for receiving the liquid diluent from said pressure regulator means and for receiving the liquid concentrate from said constant volume pump means and for mixing the liquid diluent and liquid concentrate into a liquid dilution and for pumping a variable volume of the liquid dilution;

(d) holding tank means for receiving liquid dilution from said variable volume pump means;

(e) manifold means located between said variable volume pump means and said holding tank means for directing the liquid dilution from said variable volume pump means to said holding tank means and the work station;

(f) control means for activating and deactivating said constant volume pump means and said variable volume pump means in response to preselected conditions, said control means including a pressure switch means for sensing the pressure of the liquid dilution within said holding tank means and for deactivating said constant volume pump means and said variable volume pump means when the pressure of the liquid dilution within said holding tank means is above a preselected pressure and for activating said constant volume pump means and said variable volume pump means when the pressure of the liquid dilution within said holding tank means is below a preselected pressure; and

(g) a liquid concentrate valve means located between said constant volume pump means and the liquid concentrate source for selectively preventing the flow of liquid concentrate between the liquid concentrate source and said constant volume pump means.

4,547,129

AIR STREAM GENERATING APPARATUS

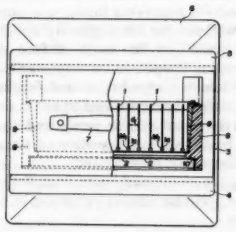
Kiyomu Endo, Tokyo, Japan, assignor to Keiko Endo, Tokyo, Japan

Filed Jan. 3, 1984, Ser. No. 567,787

Claims priority, application Japan, May 13, 1983, 58-82535

Int. Cl.[4] F04B *37/02;* B03C *1/00*

U.S. Cl. 417—48 8 Claims



1. An air flow generating apparatus comprising:

a casing having an airflow inlet and an airflow outlet;

a plurality of electrode plates having edges with a length and arranged at a predetermined interval from each other to form air flow passages in said casing, said interval having a central portion;

ionizing wires disposed at a predetermined distance from said central portions of said respective intervals between said electrode plates on an extension line displaced a distance from a line connecting said edges of said electrode plates, for producing a corona discharge between said electrode plates and said wires; and

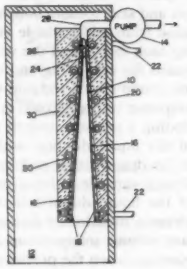
rod-shaped magnets each having a front surface and a back surface, each said magnet being attached at said back surface to said edge of a respective electrode plates along said entire length of said edge, for magnetically accelerating ions produced by said corona discharge.

4,547,130

CAPILLARY INPUT FOR PUMPS

George Y. Eastman, Lancaster, Pa., assignor to Thermacore, Inc., Lancaster, Pa.

Filed Feb. 13, 1984, Ser. No. 579,864
Int. Cl.[4] F04B *21/00*
U.S. Cl. 417—53 **11 Claims**



1. An apparatus for supplying liquid to a pump from a vapor environment without the aid of gravity comprising:

a pump for moving liquid;

a collector comprising an enclosed volume the collector outlet being attached to and opening into the input of the pump and the collector input being open to a vapor environment, the collector outlet being of such dimensions so as to act as a capillary feeding liquid to the input of the pump and so as to cause collected liquid to bridge the cross section of the collector outlet without the aid of gravity;

cooling means attached to the collector and capable of cooling the inside of the collector to cause vapor from the vapor environment to condense within the collector; and

transport means to transport liquid from the point of condensation within the collector to the collector outlet.

10. A method for supplying liquid to a pump from a vapor environment without the aid of gravity comprising:

condensing liquid onto the inside surface of a collector, the input of which is open to the vapor environment and the output of which is attached to and feeding the pump, the collector output being formed to act as a capillary feeding liquid to the input of the pump and to cause collected liquid to bridge the cross section of the collector output without the aid of gravity; and

transporting the condensed liquid from the area of condensation to the collector output by the use of a capillary pumping means.

4,547,131

REFRIGERATION COMPRESSOR AND METHOD OF ASSEMBLING SAME

Delmar R. Riffe; John P. Elson; Dilip S. Sathe, and Walter T. Grassbaugh, all of Sidney, Ohio, assignors to Copeland Corporation, Sidney, Ohio

Filed Jul. 25, 1983, Ser. No. 516,772
Int. Cl.[4] F04B *35/04*; B23P *15/00*
U.S. Cl. 417—53 **11 Claims**

1. A hermetic refrigeration compressor comprising:

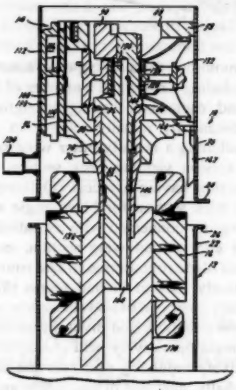
a first shell section;

a compressor assembly including a compressor housing fixedly supported within said first shell section, said compressor housing including a rotatable drive shaft extending outwardly from one end of said first shell section; and

a second shell section;

an electric driving motor assembly including a stator fixedly supported within said second shell section, said stator having a rotor receiving bore extending therethrough and a rotor supported on said drive shaft within said bore;

said first and second shell sections being radially positioned with respect to each other whereby said rotor is coaxially positioned within said bore to thereby provide a uniform air gap between said rotor and said stator said sections being welded together in said position, said weld being the sole means for preventing relative radial movement between said compressor housing fixedly supported in said first shell section and said stator fixedly supported in said



second shell section and hence maintaining said uniform air gap.

4. A method of assembling a hermetic refrigeration compressor comprising:

positioning a first shell section containing a compressor in aligned end to end relationship with a second shell section containing a stator;

aligning radially said first shell section with respect to said second shell section whereby a rotor receiving crankshaft is positioned in coaxial relationship within a rotor receiving bore of said stator; and

thereafter welding said ends of said first and second shell sections together to lock said crankshaft receiving rotor in said coaxial postion whereby a uniform air gap will be provided between the rotor and said stator.

4,547,132

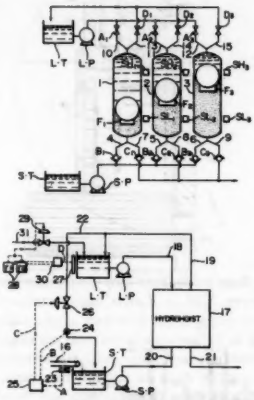
APPARATUS FOR CONTINUOUSLY TRANSFERRING A SLURRY BY LIQUID PRESSURE

Kenji Uchida, Kashiwa; Masakatsu Sakamoto, Matsudo; Makoto Saito, Ibaraki; Yukishige Kamino, Tsuchiura, Japan, and Hiroshi Miyadera, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 9, 1984, Ser. No. 639,007
Claims priority, application Japan, Sep. 14, 1983, 58-168178
Int. Cl.[4] F04F *1/10, 1/14*
U.S. Cl. 417—63 **5 Claims**

1. An apparatus for continuously transferring a slurry by liquid pressure comprising a slurry tank for storing therein a slurry containing solid matter, a plurality of feed chambers, each for temporarily storing therein said slurry from said slurry tank, and a driving liquid tank for storing therein a driving liquid having a specific gravity smaller than that of said slurry, arranged such that each said feed chamber is connected, at its bottom portion, with a slurry inlet pipe for supplying said

slurry to said feed chamber and a slurry outlet pipe for delivering said slurry from said feed chamber, and, at its top portion with a driving-liquid inlet pipe for supplying said driving liquid to said feed chamber and a driving-liquid outlet pipe for discharging said driving liquid from said feed chamber; a float member being provided inside each said feed chamber, each said float member having its buoyancy chosen as to permit each said float member to be located at the boundary surface between said slurry and said driving liquid, and valves being provided on said inlet and outlet pipes, whereby the valves are opened and closed in accordance with the instructions supplied



from detectors for detecting the position of each said float member, thereby continuously transferring said slurry in each said feed chamber by the liquid pressure, characterized in that a part of the driving liquid discharged from each said driving-liquid outlet pipe of each said feed chamber is supplied, under the control of a first flow control means, to said slurry tank in accordance with the amount of the solid matter supplied to said slurry tank; and a clean liquid is supplied, under the control of a second flow control means, to said driving liquid tank in accordance with the amount of the driving liquid supplied to said slurry tank.

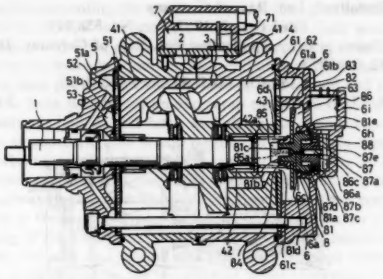
4,547,133

VARIABLE CAPACITY COMPRESSOR

Kazutoshi Nishizawa, Toyoake; Masashi Takagi, Kariya, and Yasuyuki Nishi, Obu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 3, 1983, Ser. No. 471,726
Claims priority, application Japan, Mar. 5, 1982, 57-35303
Int. Cl.⁴ F04B *1/28, 49/02;* **F16K** *31/04*
U.S. Cl. 417—270 **17 Claims**

1. A variable capacity compressor, comprising:
plural reciprocating pistons;
a housing including plural cylinder members to respectively support each of said pistons, a low-pressure chamber, a high-pressure chamber and a discharge chamber receiving discharge through discharge ports in some of said cylinder members;
a check valve selectively allowing fluid to flow only from said discharge chamber to said high-pressure chamber;
an on-off valve disposed between said low-pressure chamber and said discharge chamber, and having discharge valves selectively disposable against said discharge ports;
a pressure room formed between said housing and said on-off valve and having a connecting port to connect said pressure room and said discharge chamber; and
electric means for selectively opening and closing said discharge valves of said on-off valve against said discharge ports while also respectively closing and opening said connecting port, operation of said on-off valve selectively establishing connection between said low-pressure chamber and said discharge chamber so as to vary the capacity of said compressor, and wherein pressure from said discharge chamber is communicated through said opened connecting port to press on said on-off valve in a closing direction thereof.

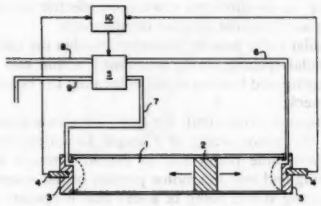


4,547,134

DOSING DEVICE

Erkki A. Hirvonen, Salmintie 8 B 10, SF-71800 Siilinjärvi, Finland

Filed Dec. 16, 1982, Ser. No. 449,881
Claims priority, application Finland, Jan. 6, 1982, 820026
Int. Cl.⁴ F04B *17/00, 35/00*
U.S. Cl. 417—349 **3 Claims**



1. An improved device for pumping fluid in measured doses of the type having a cylinder, a piston located within said cylinder for reciprocating movement therein, pipe means connected to opposite ends of said cylinder alternately for feeding fluid under pressure into said cylinder to displace said piston and for discharging fluid from said cylinder in response to displacement of said piston by fluid pressure on an opposite side thereof, valve means connected to said pipe means for alternately directing fluid under pressure through said pipe means to a first end of said cylinder and discharging fluid from a second end, and directing fluid under pressure to said second end and discharging fluid from said first end thereof, thereby controlling a direction of travel of said piston in said cylinder, and switch means fitted at said cylinder ends for sensing a predetermined location of said piston relative to said cylinder ends and generating a signal in response thereto, the improvement comprising:
control means for actuating said valve means to reverse a flow of pressurized fluid to and a discharge of fluid from said cylinder ends at predetermined, uniform time intervals and in response to said signal from said switch means, whereby the frequency of strokes of said piston within said cylinder, and consequently a volume flow rate of fluid discharged from said cylinder, is substantially constant, regardless of variations in fluid pressure or viscosity.

4,547,135

MOTOR-PUMP UNIT

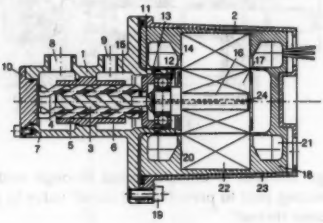
Alois Noel; Josef Zeitvogel; Erhard Wunderlich, all of Radolfzell, and Michael Meichsner, Moos, all of Fed. Rep. of Germany, assignors to ALLWEILER AG Aktiengesellschaft, Radolfzell, Fed. Rep. of Germany

Filed Dec. 7, 1983, Ser. No. 558,919

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1982, 3245973

Int. Cl.⁴ F04B *39/06;* **F04C** *1/10*

U.S. Cl. 417—360 **7 Claims**



1. in an assemblage of a screw-type pump and attached electric motor for driving the pump, the pump being of the screw-spindle type having axially elongated casing means apertured for connection to both a suction line and a high-pressure discharge line spaced axially of each other, and the motor including a rotor and stator, and being spaced axially of the pump:

the improvement comprising, in combination:

the pump casing means being shaped and arranged and axially extended, beyond the screw-spindle drive for the pump, in the direction toward the electric motor, to provide an elongated annular tubular neck;

an annular roller bearing positioned within the tubular neck;

an annular spacing sleeve positioned within said neck and engaging said bearing to aid in locating the bearing within the neck;

an elongated drive shaft, for both the screw-spindle pump and the motor, being of a length to cooperate with the screw-spindle pump and to extend through said roller bearing and into the motor portion of the assemblage;

the spacing sleeve being of a size that is operative to limit axial motion of the spindles of the screw-spindle pump toward the bearing;

a portion of the drive shaft, that extends away from the pump and past the bearing, having the rotor of the electric motor cantilever mounted thereon, and rotatable with the shaft;

the stator of the motor being pot shaped and being surrounded by an exterior casing wall, the pot shape of the stator providing for telescopic sliding of the motor stator over the motor's rotor to effect assembly of the motor and the pump; and

means for effecting fastening of the motor's pot-shaped stator to the housing of the pump.

4,547,136

VARIABLE DISPLACEMENT PERISTALTIC PUMP

Robert A. Rothstein, New York, N.Y., assignor to Manostat Corporation, New York, N.Y.

Filed Nov. 5, 1984, Ser. No. 668,402

Int. Cl.⁴ F04B *43/12, 45/08*

U.S. Cl. 417—475 **7 Claims**

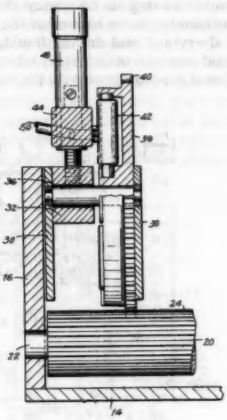
1. A variable displacement peristaltic pump, comprising:

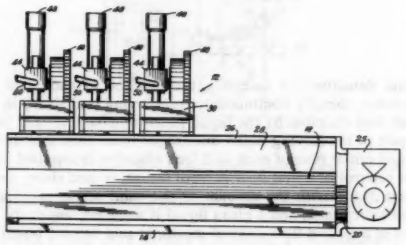
a housing;

a rotor supported in said housing for rotation about the longitudinal axis of said rotor;

rotatable pinch rollers carried by said rotor and arranged in a spoke-like array with the rotational axis of each said pinch roller extending radially of said rotor axis and movable in a plane perpendicular to said rotor axis;

a stator adjustably supported by said housing in adjacent parallelism with the plane of movement of said pinch rollers;





adjustment means for moving said stator relative to said rotor axis along a line perpendicular to said rotor axis; and

resiliently flexible tube means carried by said stator and interposed between said stator and said pinch rollers, said pinch rollers engaging and compressing said tube with a travelling pinch action.

4,547,137

SCROLL TYPE FLUID COMPRESSOR WITH THICKENED SPIRAL ELEMENTS

Kiyoshi Terauchi, Isesaki, and Masaharu Hiraga, Honjo, both of Japan, assignors to Sanden Corporation, Isesaki, Japan

Filed Sep. 26, 1983, Ser. No. 535,848

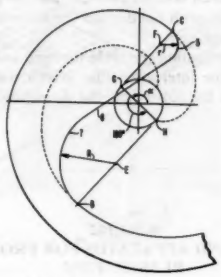
Claims priority, application Japan, Sep. 26, 1982, 57-167063

Int. Cl.⁴ F04C *18/04*

U.S. Cl. 418—55 **8 Claims**

1. In a scroll type fluid compressor including a housing having a fluid inlet port and a fluid outlet port, a fixed scroll fixedly disposed relative to said housing and having a circular end plate from which a first spiral wrap extends axially into the interior of said housing, an orbiting scroll movably disposed for non-rotative orbital movement at a substantially constant orbital radius within the interior of said housing and having a circular end plate from which a second spiral wrap extends, said first and second wraps defined in part by inner and outer involute side wall surfaces and interfitting at an angular and radial offset to make a plurality of line contacts to define at least one pair of sealed off fluid pockets, drive means opera-

tively connected to said orbiting scroll to effect the orbital motion of said orbiting scroll while preventing rotation of said orbiting scroll, thus causing the fluid pockets to diminish in volume due to the orbital motion of said orbiting scroll, the fluid pockets eventually merging to form a single high pressure pocket generally at the center of the scrolls and adjacent the fluid output port, the improvement wherein the involute curve which forms the outer side wall surface of each of said wraps starts from an arbitrary involute angle, the involute curve



which forms the inner side wall surface of each of said wraps starts at an involute angle which is 180° greater than said arbitrary involute angle, and said starting points are interconnected by an inner end surface comprised of at least two arcuate surfaces to form a thicker inner end portion of said wrap, whereby the inner end portion of each wrap is strengthened and the innermost line contact defining the central high pressure pocket moves further inwardly toward the center of said wraps to minimize reexpansion of the compressed fluid back into the adjacent pair of fluid pockets.

4,547,138

LUBRICATING MECHANISM FOR SCROLL-TYPE FLUID DISPLACEMENT APPARATUS

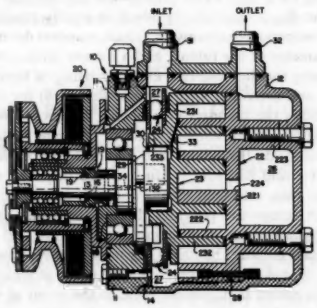
Atsushi Mabe; Shigemi Shimizu, and Akihiro Kawano, all of Gunma, Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Mar. 15, 1984, Ser. No. 589,755

Claims priority, application Japan, Mar. 15, 1983, 58-36342[U]; Mar. 15, 1983, 58-36343[U]

Int. Cl.⁴ F01C *1/04, 21/04*

U.S. Cl. 418—55 **4 Claims**



1. In a scroll-type fluid displacement apparatus including a housing having a front end plate, a fixed scroll fixedly disposed relative to said housing and having a first circular end plate from which a first wrap extends, an orbiting scroll having a second circular end plate from which a second wrap extends, said first wrap and second wrap interfitting at an angular and radial offset to make a plurality of line contacts to define at least one pair of sealed-off fluid pockets, and a driving device including a drive shaft rotatably supported on said front end plate and operatively connected to said orbiting scroll to effect the orbital motion of said orbiting scroll, a rotation-preventing device for preventing the rotation of said orbiting scroll during its orbital motion whereby the volume of the fluid pockets changes, said driving device including a drive pin projecting at an eccentric location from the inner end of said drive shaft, an annular boss projecting from the side of said second end plate opposite from which said second wrap extends and a bushing rotatably carried in said boss, said drive pin being disposed within an eccentric hole in said bushing to operatively support said orbiting scroll, lubricating means for lubricating at least the interior of said boss, said lubricating means including an oil passageway having an inlet opening at one of said fluid pockets located at the outer peripheral portion of said wraps, an outlet opening at the interior of said boss and a hollow interior extending through said second end plate between said inlet and outlet openings to transfer a slight part of the compressed fluid and intermixed lubricating oil from said last-mentioned fluid pocket to the interior of said boss.

4,547,139

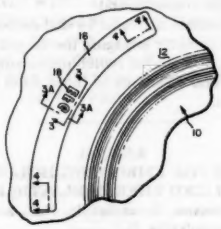
TIRE MOLD

James B. Hershberger, Cresaptown, Md., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 17, 1984, Ser. No. 682,398

Int. Cl.⁴ B29H *5/02*

U.S. Cl. 425—28 D **11 Claims**



1. A tire mold including a mold member provided with a surface engageable with a portion of an uncured tire, a detachable indicia forming member engageable with a portion of an uncured tire to form indicia on a surface of the tire, and means for releasably retaining said indicia forming member on said mold, said last mentioned means being carried in part by said indicia forming member and in part by said mold member and including movable cam means carried at least by one of said indicia forming member and mold member to releasably latch said indicia forming member to said mold member.

4,547,140

ROTARY INJECTION MOLDING PRESS

Dhu Aine J. Davis, Bruceville, Ind., assignor to Illinois Precision Corporation, Wheaton, Ill.

Filed Apr. 4, 1983, Ser. No. 482,019

Int. Cl.⁴ B29F *1/00*

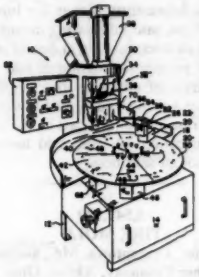
U.S. Cl. 425—138 **5 Claims**

1. In a press for injection molding of plastic parts of the type having a frame, a movable platform disposed on said frame, at least one mold block having a bottom secured to said platform and an opening and closing hinged top, an injection mechanism adapted to inject liquid plastic into said mold block when closed, and indexing means to move said platform and transport the mold block to an inject station wherein the injection mechanism injects plastic into the mold from a prep station wherein the mold block is prepared for injection of plastic, and

to an eject station where a molded plastic element is removed from the mold prior to return of the mold to the prep station, the improvement comprising:

a first actuator disposed on said press exteriorly of said mold block to engage the hinged top of an open mold block moved by said indexing means to said inject station from said prep station;

first switch means activated by said actuator upon said actuator engaging the hinged top of an open mold block, said switch means stopping said press to prevent said open mold block from moving to said inject station;



a second actuator disposed within said bottom of the mold block to be engaged by the hinged top of a closed mold block moved by said indexing means to said eject station from said inject station; and

second switch means activated by said second actuator upon said second actuator engaging the hinged top of a closed mold block, said second switch means stopping said press to prevent said closed mold block from moving to said eject station.

4,547,141

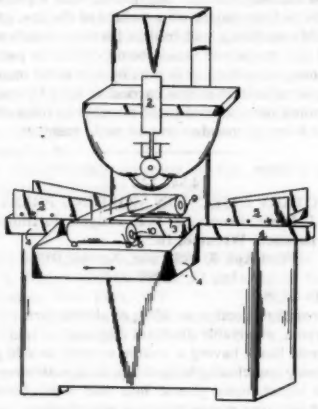
APPARATUS FOR EMBOSSING HOLOGRAMS ON METALIZED THERMOPLASTIC FILMS

Henry W. Ruschmann, Bernardsville, N.J., assignor to Alpha Foils Inc., Bernardsville, N.J.

Filed Jul. 5, 1984, Ser. No. 627,782

Int. Cl.[4] B29D *11/00*

U.S. Cl. 425—374 **1 Claim**



1. Apparatus for embossing a hologram image upon the metalized surface of a thermoplastic film, which comprises;

a free-wheeling pressure roller mounted to move vertically on a stationary horizontal axis;

a table, mounted to reciprocate in a forward and rearward line parallel to said horizontal axis;

a die having a flat surface bearing a negative hologram image corresponding to said hologram image, mounted on the table so that upon forward and rearward reciprocation of the table, the die is carried beneath the roller;

means to intermittently interpose a metalized thermoplastic film in pressured contact between the die and the roller;

means associated with the die and the roller for heating the interposed film; and

means for reciprocating the table forward and backward so as to carry the interposed film in and out of pressured contact with the roller and the die whereby embossing occurs.

4,547,142

PROCESS AND APPARATUS FOR PRODUCING PLASTIC PIPE

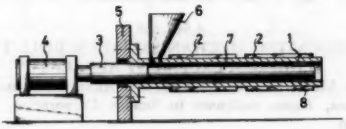
Clemens Arenhövel; Joachim Much; Ali-Maher Onallah, and Volkmar Schmidt, all of Oberhausen, Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Continuation of Ser. No. 64,959, Aug. 8, 1979, abandoned. This application Dec. 31, 1981, Ser. No. 336,119

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1978, 2836052

Int. Cl.[4] A21C *11/16*

U.S. Cl. 425—378 R **6 Claims**



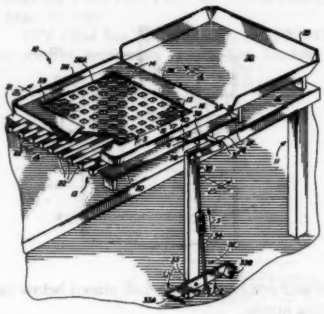
1. A ram extruder for the production of tubing from ultrahigh-molecular-weight low pressure polyethylene having a molecular weight of more than 500,000 which consists essentially of a die (1) heated by means of heating elements (2) disposed along its length, a ram (3) which is horizontally reciprocated in the die, a mandrel (7) which is rigidly attached to the ram and reciprocable therewith, which mandrel determines the inside diameter of the tubing, and a former with a cooling jacket adjoining the die, said ram extruder being of horizontal construction and provided with a guide sleeve (8) for startup which surrounds the mandrel (7), feeding means for feeding polymer powder into an annular zone of constant dimension defined on the inside thereof by said mandrel and on the outside thereof by said die, said feeding means disposed downstream of said ram, said feed means comprising a gravity fed hopper which brings the polymer directly into said annular zone in the absence of any intervening constrictions, said extrusion die and said mandrel having a constant diameter over the entire length of said annular zone from the point at which said feeding means enters said annular zone to the point at which said tube emerges from said die, whereby when said ram reciprocates to reciprocate said mandrel said particles are transported and compacted by movement of said ram without obstruction and disturbances, the length of the former being from three to eight times the outside diameter of the tubing being produced and being either cylindrical or tapering conically with a pitch $\leqq$1:50, said heating elements being disposed downstream of said feeding means.

4,547,143

BITE SIZE CANDY MOLDING MACHINE

James J. Cerreta, 2866 Grand Ave., Phoenix, Ariz. 85017

Filed Jul. 9, 1984, Ser. No. 629,201
Int. Cl.[4] A23G *1/20, 3/18*
U.S. Cl. 425—447 9 Claims



1. An apparatus for molding bite size pieces of candy comprising:

a support,

a flat bottom mixing tray mounted on said support,

said mixing tray having a rim extending around only a first portion of its periphery with the remainder of its periphery forming a first opening,

a flat bottom dispensing tray having a rim extending around only a portion of its periphery with the remainder forming a second opening,

hinge means for pivotally connecting said mixing tray and said dispensing tray together at the first and second openings so that the flat bottoms of said mixing tray and said dispensing tray can be coplanar when said dispensing tray is in a predetermined horizontal position,

said dispensing tray defining a third opening in its flat bottom,

a rack mounted on said support below said mixing tray in a position parallel with said dispensing tray when in said predetermined horizontal position,

a mold defining a plurality of cavities mountable on said rack below said mold in a position to expose said cavities through said third opening in said dispensing tray, and

means for pivotally moving said dispensing tray relative to said mixing tray to expose said rack in order to place thereon and to remove therefrom said mold.

4,547,144

FUEL GAS CONTROL

Paul Dietiker, Redondo Beach, Calif.; Elwyn H. Olson, St. Paul, and Ralph H. Torborg, Minnetonka, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 8, 1983, Ser. No. 511,825
Int. Cl.[4] F23N *3/00*
U.S. Cl. 431—20 21 Claims

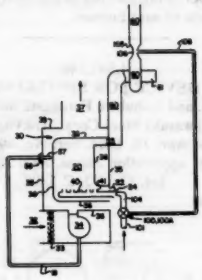
1. A furnace system comprising:

a fuel gas control for supplying fuel gas to a furnace, the control comprising an inlet chamber having an inlet for receiving a supply of fuel gas and an outlet chamber having an outlet for providing a supply of fuel gas to the furnace, the inlet and outlet chambers being connected by a valve opening; a valve operatively associated with the opening, the valve having a closed position for preventing the flow of fuel gas through the opening and an open position for permitting the flow of fuel gas through the opening; and control chamber means for moving the valve between its open and closed positions in response to pressure variations within the control chamber means;

a combustion air blower for supplying combustion air to the furnace for burning the fuel gas to form combustion gases;

an exhaust stack for exhausting combustion gases from the furnace;

a venturi nozzle in the flow of combustion gases; and



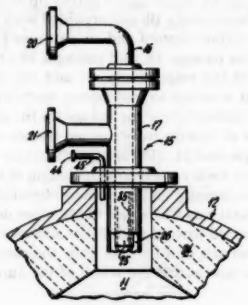
means for directly connecting the control chamber means to the venturi nozzle so that the valve is positioned in response to the pressure signal generated in the venturi nozzle by the flow of combustion gases and for moving the valve to its closed position under blocked exhaust stack conditions.

4,547,145

COMBINATION WITH A HIGH TEMPERATURE COMBUSTION CHAMBER AND TOP BURNER

Frederick C. Jahnke, Rye, N.Y., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Mar. 9, 1983, Ser. No. 473,470
Int. Cl.[4] F23D *5/12*
U.S. Cl. 431—76 3 Claims



1. In combination, a high temperature combustion chamber being the interior of a synthesis gas generator having a thick refractory lining,

a downwardly directed burner having two coaxial feed stream conduits at the top of said combustion chamber for introducing feed streams of the constituents of a synthesis gas generation process to be carried out in said synthesis gas generator,

said feed stream conduits merging at the outlet ends to form a joint nozzle outlet, and

means for transmitting radiant energy for measuring temperature of a predetermined location in said combustion chamber,

said radiant energy transmitting means comprising an optical fiber attached to the inside surface of one of said feed stream conduits and having an input end for receiving

radiant energy from the interior of said combustion chamber at an angle,

means for directing said input end toward the inside of a wall of said combustion chamber so as to receive radiant energy from the interior and at an angle for measuring conditions on the inside of said thick refractory lining, and

said optical fiber being located in the path of one of said feed streams inside of said burner.

4,547,146

IGNITION DEVICE FOR SINTERING MACHINE

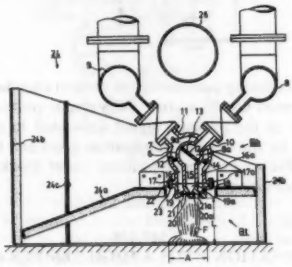
Kunihiro Tanaka, and Nobuhiro Futagami, both of Chiba, Japan, assignors to Kawasaki Steel Corp., Tokyo, Japan

Filed Apr. 16, 1984, Ser. No. 600,580

Claims priority, application Japan, Apr. 28, 1983, 58-73849

Int. Cl.[4] F23C *5/08*

U.S. Cl. 431—180 **2 Claims**



1. An ignition device for a moving grate type sintering machine comprising; a fuel gas supply pipe **8** and a combustion air supply pipe **9**; a downwardly-faced burner body Bb connected to said supply pipes **8,9** and provided with a gas passage **15** in a central portion thereof and air passage **16**, **16*a*** on either side gas passage **15**; an elongated burner tip Bt attached removably to said burner body Bb and provided with a gas passage **18** in a central portion thereof and air passages **19**, **19*a*** on either side of said gas passage **18**, said passages **18,19,19*a*** facing said passages **15,16,16*a*** respectively, in said burner body Bb; an ignition hood attached to said burner body Bb enclosing the ignition atmosphere below the burner tip Bt; and a plurality of combinations of downwardly opened burner nozzle holes **20**, **20*a*** for fuel gas and **21**, **21*a*** for combustion air provided along said burner tip, each combination including in a common plane a pair of downwardly and oppositely directed fuel gas holes having a central axis and a pair of air holes downwardly and inwardly directed toward each other and each having an axis intersecting an axis of a fuel gas hole, the combinations being arranged in a row across the width of the burner body.

4,547,147

COMBUSTION DEVICE FOR A CAR

Hiroyoshi Suzuki, Himeji, and Shoichi Washino, Suita, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 31, 1984, Ser. No. 615,551

Claims priority, application Japan, Jun. 30, 1983, 58-120838

Int. Cl.[4] F23Q *3/00*

U.S. Cl. 431—265 **5 Claims**

1. A combustion device for a car which comprises:

a fuel-atomizing nozzle for atomizing and injecting fuel,

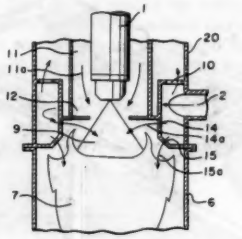
a combustion tube extending axially of said nozzle in the direction of injection of fuel,

means forming a coaxial airstream supplying passage extending along the outer circumference of said fuel-atomizing nozzle,

a substantially flat orifice plate for fuel mixture formed near the inlet of said combustion tube and at a lower side of said fuel-atomizing nozzle,

an ignition means placed between said orifice plate and said fuel-atomizing nozzle, and

means forming a lower airstream supplying passage which has at least one aperture opened with a downward component to said combustion tube and placed below said fule-atomizing nozzle,



wherein said lower airstream supplying passage has at least one additional aperture comprising means to feed a part of said lower airstream in a radially inward direction and substantially along the lower surface of said orifice plate.

4,547,148

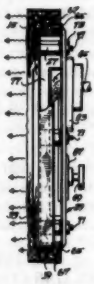
GAS-FIRED RADIANT BURNER

Larry G. Holmer, Woodstock, Ill., assignor to Refractory Products Co., Elgin, Ill.

Filed Oct. 29, 1984, Ser. No. 666,043

Int. Cl.[4] F23D *13/12*

U.S. Cl. 431—328 **9 Claims**



1. A radiant gas-fired burner comprising

a back plate, the front face of which is constructed to partially define a plenum for supplying a combustible air-gas mixture, and the rear face of which includes means for connection to a supply of air and gas,

a combined refractory fiber pad-metal support structure including a foraminous metallic member which is embeddod within a porous pad of refractory fibers, said fiber pad and said foraminous metallic member being interlocked with each other,

said metallic member having lugs affixed to a rear surface thereof and

means for connection to said lugs to join said back plate and said combined structure into assembled condition, with said plenum located generally adjacent the rear surface of said porous refractory fiber pad.

4,547,149

SYSTEM FOR PREVENTING LIQUIDS FROM BEING DRIVEN TO THE FLAIR STACK TIP

Gerard Chaudot, 14, Allee de La Rochefoucauld, Andresy 78570, France

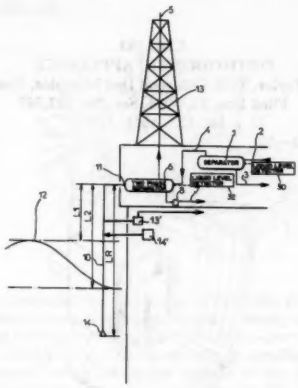
PCT No. PCT/FR82/00156, § 371 Date May 23, 1983, § 102(e) Date May 23, 1983, PCT Pub. No. WO83/01086, PCT Pub. Date Mar. 31, 1983

PCT Filed Sep. 23, 1982, Ser. No. 506,647

Claims priority, application France, Sep. 23, 1981, 81 17969

Int. Cl.[4] F23D *13/10*

U.S. Cl. 431—202 10 Claims



1. A system for safely burning hydrocarbon gases given off by the production or treatment of hydrocarbons, by preventing the accidental burning of hydrocarbon liquids which might become entrained in the hydrocarbon gases stream being burned, comprising:

a. a gas-liquid separator chamber for separating gas hydrocarbons from liquid hydrocarbons;

b. an overflow column connected to said gas-liquid separator chamber at a given liquid overflow level which is above a normal liquid fuel level, such that when the liquid hydrocarbon level in said separator chamber reaches the overflow level, the liquid hydrocarbons flow through the overflow column to a discharge end located at a given distance from the gas-liquid separator chamber and beneath the surface of a body of water at the site of the installation, to be discharged into the water and dissipated thereby; and

c. a flare tip, connected through a flare pipe and a gas flow chain to said gas-liquid separator chamber at a location above said liquid overflow level for burning gases separated by said gas-liquid separator chamber, such that the over-flow column prevents liquid from rising to a level at which it might become entrained in the gases flowing to the flare tip to be burned, to prevent the accidental burning of entrained liquid hydrocarbons with the hydrocarbon gases.

4,547,150

CONTROL SYSTEM FOR OXYGEN ENRICHED AIR BURNER

Frank J. Vereecke, Palmyra, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed May 10, 1984, Ser. No. 608,722

Int. Cl.[4] F23D *13/00*

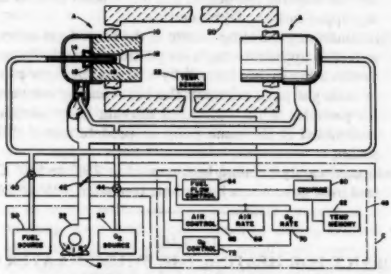
U.S. Cl. 432—12 10 Claims

1. A method of heat treating workpieces comprising:

(a) placing the workpieces to be heat treated in a furnace;

(b) supplying fuel, air, and oxygen rich gas to a burner communicating with the furnace at generally constant fuel, air, and oxygen rich gas supply rates until the furnace reaches a preselected set point temperature;

(c) decreasing the fuel and oxygen rich gas supply rates after the furnace reaches the preselected set point temperature without decreasing the air supply rate such that the relative fuel, oxygen rich gas, and air supply rates maintain a generally stoichiometrically balanced combustion relationship; and,



(d) continuing decreasing the fuel supply rate and commencing decreasing the air supply rate after decreasing the oxygen rich gas supply rate to a preselected minimum oxygen rich gas supply rate in such a manner that the combustion remains substantially stoichiometrically balanced.

4,547,151

METHOD OF HEAT-TREATING PARTICLES AND APPARATUS THEREFOR

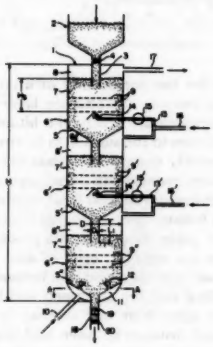
Hirro Takeda, Kawasaki, Japan, assignor to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1984, Ser. No. 585,199

Claims priority, application Japan, Mar. 1, 1983, 58-31791

Int. Cl.[4] F27B *15/00;* F26B *17/00*

U.S. Cl. 432—14 10 Claims



1. A method of heat-treating particles selected from the group consisting of used catalysts and used adsorbents by contacting within a contacting receptacle particles fed from the top portion of the receptacle with a heated gas introduced from its bottom portion, which comprises

(1) moving the particles sequentially from an upper to a lower moving layer portion through a multiplicity of moving layer portions formed by partitioning said contacting receptacle with a plurality of funnel-shaped supporting plates, said movement being effected via porous

plates provided in the individual moving layer portions to thereby prevent blocking of the particles,

(2) meanwhile causing the heated gas to rise sequentially from the lowermost moving layer portion to upper moving layers to contact it with the particles in each of the moving layer portions, the heated gas being supplied through a gas pipe leading from the gas layer of each moving layer portion to an umbrella-shaped gas dispersing plate provided in the adjoining upper moving layer portion to disperse the heated gas introduced in each adjoining upper moving layer, and

(3) maintaining the temperature of the heated gas introduced into each upper moving layer portion through the gas pipe or elevating or lowering it by a heat exchanger provided in each gas pipe, whereby the heat-treating temperatures for particles in the individual moving layer portions are maintained at the same point or predetermined different points,

said used catalysts being heat treated at 250° to 550° C. and said used adsorbents being heat treated at 105° to 260° C.

4,547,152

DEVICE FOR HEATING THE BITUMEN LAYER OF ROLLED ROOFING MATERIAL

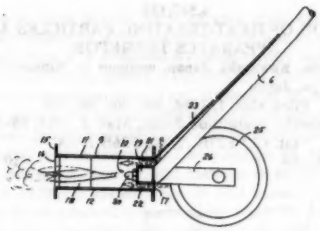
Find Svendsen, Solbergsgatan 9, S-664 00 Grums, Sweden

PCT No. PCT/SE82/00291, § 371 Date May 7, 1984, § 102(e) Date May 7, 1984, PCT Pub. No. WO84/01179, PCT Pub. Date Mar. 29, 1984

PCT Filed Sep. 22, 1982, Ser. No. 610,293

Int. Cl.[4] F24J *3/00, 3/02;* F23C *5/00*

U.S. Cl. 432—229 **5 Claims**



1. A device for the combustion of a combustible gas for heating without burning the bitumen layer of rolled roofing material to a temperature where the bitumen is so soft and sticky that it adheres to the surface to be covered, comprising:

a burner assembly comprising a box-like casing or frame, having a front opening and a rear opening spaced a predetermined distance from said front opening, consisting of a top sheet a bottom sheet and a pair of parallel gable plates, said pair of gable plates spaced a predetermined distance apart from one another, each of said gable plates connected to said top sheet and said bottom sheet, said gable plates holding said top sheet and said bottom in parallel and spaced apart from one another by a predetermined distance, said distance between said front and rear openings being greater than said distance between said top and bottom sheets, said distance between said gable plates being greater than said distance between said front and rear openings; and a distributing pipe, fitted with a plurality of closely distributed burner nozzles disposed in a row, for said combustible gas, said distributing pipe disposed within said casing and extending from one gable plate to the other gable plate, said distributing pipe being parallel to and spaced apart from each of said top sheet and said bottom sheet, said spaces between said top sheet and said distributing pipe and said bottom sheet and said distributing pipe forming respective air slits, said air slits admitting air from the rear opening of the casing to the burner nozzles; and

wheel means, connected to said burner assembly, for supporting said burner assembly for rolling movement on said surface to direct said burner in a desired manner.

4,547,153

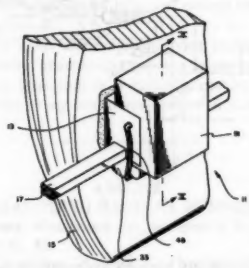
ORTHODONTIC APPLIANCE

Robert F. Taylor, 1528 Oakwood Dr., Memphis, Tenn. 38116

Filed Dec. 13, 1984, Ser. No. 681,387

Int. Cl.[4] A61C *3/00*

U.S. Cl. 433—11 **9 Claims**



1. An orthodontic appliance of the type including an arch wire for causing a corrective force to be exerted against a patient's teeth, wherein said improvement comprises:

(a) a bracket for being fixedly attached to one of the patient's teeth, said bracket having a face surface and having a slot in said face surface for receiving said arch wire;

(b) a cap provided over said face surface of said bracket;

(c) hinge means for pivotally attaching said cap to said bracket for movement between an opened position in which said arch wire can be placed in or removed from said slot in said bracket and a closed position in which said arch wire is held within said slot;

(d) clamp means for holding said cap against said face surface of said bracket to coact with said cap to hold said arch wire within said slot, said clamp means including a bail member attached to said bracket and extending over said cap, said bail member being pivotally attached to said bracket for movement between a first position in which said cap is allowed to pivot between said open and closed positions and a second position in which said cap is held in said closed position; and

(e) an auxiliary means attached to said bracket for exerting additional corrective force against the patient's teeth through said bracket, said auxiliary means including an auxiliary body member for being securely attached to said bracket and including a force means attached to said auxiliary body member for exerting additional corrective force against the patient's teeth; said auxiliary body member including a first flange for engaging said face surface of said bracket, including a second flange for engaging the surface of said bracket opposite said face surface thereof, and including a bridge joining said first and second flanges thereof; said first flange being fixedly secured to said bracket when said cap is in said closed position and said bail member is in said second position.

4,547,154

DEVICE FOR THE ENCAPSULATION IN PLASTER OF MODELS OF THE JAW FOR THE MANUFACTURE OF DENTAL PROSTHESES

Johannes Puschmann, Landshuter Strasse 4, 8252 Taufkirchen, Fed. Rep. of Germany

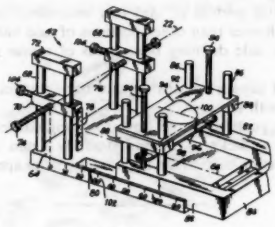
PCT No. PCT/EP84/00111, § 371 Date Nov. 26, 1984, § 102(e) Date Nov. 26, 1984, PCT Pub. No. WO84/04034, PCT Pub. Date Oct. 25, 1984

PCT Filed Apr. 11, 1984, Ser. No. 674,699

Claims priority, application Fed. Rep. of Germany, Apr. 12, 1983, 3313198

Int. Cl.⁴ A61C *19/00*

U.S. Cl. 433—49 **9 Claims**



1. In a device for the encapsulation in plaster of jaw models for the manufacture of dental prostheses, having an articulator which has a lower model support for a lower-jaw template and an upper model support for an upper-jaw template, the upper model support being swingable relative to the lower model support around the horizontal condylar axis, the improvement comprising:

a frame having a bottom plate for supporting the articulator, means for fixing the condylar axis relative to the bottom plate, and

a table parallel to the bottom plate and having a top surface which determines the bite plane and is adjustable vertically and sagitally with respect to the condylar axis.

4,547,155

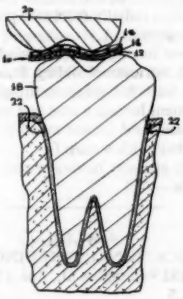
SHIELDED DENTAL CONTACT MARKER

Harold A. Adler, 1457 Eastwind Cir., Westlake Village, Calif. 91361

Filed Mar. 15, 1984, Ser. No. 590,198

Int. Cl.⁴ A61C *9/00*

U.S. Cl. 433—70 **8 Claims**



1. A penetration-resistant structurally-compressive shielded dental contact marker for marking

a premature contact area between upper and lower teeth comprising:

a very thin very flexible supporting layer;

a very thin very flexible marking layer adhered to one side of said very thin very flexible supporting layer, said very thin very flexible marking layer to cause marking of a tooth only in that premature contact area which is in direct forceful contact with that tooth; and

a very thin, very flexible, hard, low-flow under pressure protective layer of material permanently adhered to said very thin very flexible marking layer, said protective layer of material comprising a wax mixture composition including paraffin wax, carnauba wax, beeswax, ceresin and microcrystalline waxes in the ranges of: paraffin way—50 percent to 60 percent, carnauba wax 15 percent to 25 percent, beeswax—15 percent to 40 percent, ceresin—3 percent to 6 percent, and microcrystalline waxes—3 percent to 8 percent by weight; said very flexible penetration-resistant structurally-compressive layer having a required thickness of between 0.0005 and 0.004 inches and having the required physical characteristics of being hard non-sticky and very low flow under pressure so as to constitute a barrier sufficiently resistant during the beginning portion of forceful contact between approximating dental surfaces as to move with and give complete protection to said marking layer from close, casual or sliding contact with tooth surfaces and will prevent significant penetration by said approximating tooth surfaces until sufficient compressive force is applied in a direction normal to said supporting layer as will compress the periodontal membrane of the engaged teeth by about half thereby solidly seating the roots of said engaged teeth in their respective bony sockets, holding said teeth solidly upright, and only then permitting penetration through said specifically-structured pressure-selective shield material and solidly striking said very thin very flexible marking layer against said approximating tooth surface thereby marking it only at said specified-penetration areas, said very thin very flexible marking layer being otherwise continuously protected by said very thin very flexible pressure-selective protective shield layer against all other tooth contact.

4,547,156

COUPLING FOR RELEASABLY FIXING A DENTAL PROTHESIS IN THE MOUTH

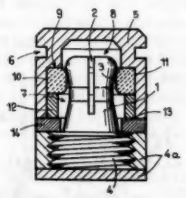
Helmut Hader, Les Allees 25, 2300 - La Chaux-De-Fonds, Switzerland

Filed Feb. 14, 1984, Ser. No. 580,551

Claims priority, application Switzerland, Feb. 23, 1983, 1014/83

Int. Cl.⁴ A61C *13/22*

U.S. Cl. 433—172 **8 Claims**



1. A coupling for releasably fixing a dental prosthesis in the mouth, comprising a femal epart and a male part, the female part having a rigid contact piece in hard material having a through hole that is waisted and that has a circular edge at the juncture of two annular surfaces on the contact piece that meet at said edge at an angle to each other, said annular surfaces being polished, the male part having a free end and a resiliently deformable head of a material softer than said hard material having a greatest diameter which in its undeformed condition is greater than the diameter of said edge, the male art having a portion of lesser diameter than said head on the side of said

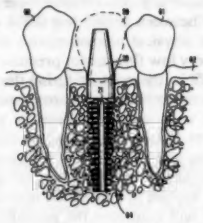
head away from said free end, said edge having line contact with said portion of lesser diameter when the male part is engaged in the female part, said line contact being the only contact between said male part and said rigid contact piece.

4,547,157

SUBMERGIBLE POST-TYPE DENTAL IMPLANT SYSTEM AND METHOD OF USING SAME

Thomas D. Driskell, Westerville, Ohio, assignor to Miter, Inc., Columbus, Ohio

Filed Apr. 20, 1983, Ser. No. 486,903
Int. Cl.[4] A61C *8/00*
U.S. Cl. 433—173 **25 Claims**



1. A submergible, post-type system for use in combination with an artificial dental element for implanting said artificial dental element into the bone structure of a human jaw, said system comprising:

an anchoring root member having a first end adapted for securely seating within said bone structure, and a second, opposite post end;

a temporary healing cap adapted to be received by said post end during healing of said bone structure around the first end of said anchoring root member; and

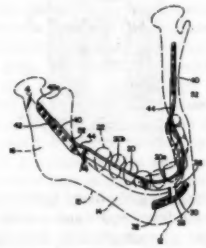
an implant head adapted to receive said artificial dental element and being receivable by said post end after removal of said temporary healing cap, said implant head having a subgingival base portion the size and shape of which is simulated by said temporary healing cap.

4,547,158

DENTURE SUPPORT FRAME

Harold D. Roberts, 8115 Adera, Vancouver, B.C., Canada V6P 5E4

Filed Jul. 2, 1984, Ser. No. 627,079
Int. Cl.[4] A61C *8/00*
U.S. Cl. 433—176 **4 Claims**



1. A denture support frame arranged to be secured to the lower jaw of a person for supporting an artificial denture thereon, said frame comprising

a one-piece U-shaped bar having upper and lower edges and arranged to support an artificial denture on its upper edge, said bar having front, side and rear portions with the front being curved to conform to the front curvature of the jaw and the side portions extending rearwardly in vertical alignment with the sides of the jaw bone whereby said front and side portions are of a contour similar to the contour of the lower jaw of a person,

said front and side portions being arranged to overlie the lower jaw in substantially parallel relation thereabove,

a rear ramus implant portion on each side of said bar arranged to be implanted in recesses cut in the ramus portions of the jaw bone,

each of said ramus implant portions comprising an upwardly angled rear extension of said side portions and having first and second portions with said second portion terminating in a free end arranged for penetration into ramus portions of the jaw,

said second portion of said rear extensions being substantially thinner than other portions of said bar for between narrow side defining bone areas of ramus portions of a jaw,

and front support means on said bar arranged for engagement with the jaw

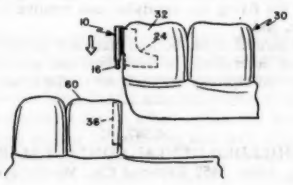
said first portion of the upwardly angled rear extensions having a thickness of approximately 2 mm. and said second portion thereof having a thickness of approximately 1 mm.

4,547,159

SNAP-IN ANCHOR FOR DENTURE

Max Zuest, 595 San Fernando, San Diego, Calif. 92106, and Paul Zuest, 13531 Orange Blossom La., Poway, Calif. 92064

Filed Dec. 19, 1984, Ser. No. 683,478
Int. Cl.[4] A61C *13/22*
U.S. Cl. 433—181 **9 Claims**



1. A snap-in anchor for securing a denture to an existing tooth, comprising:

a male element having an elongated cylindrical pin with a substantially spherical ball on one end;

a tongue extending radially from said pin for embedding and securing in a denture;

a female element having an open-sided channel to receive said pin with a frictional sliding fit, said channel having resilient side walls for gripping the pin;

said female element having a base end with a socket member secured therein, said socket member having a socket to receive said ball with a snap fit;

and said female element having means for retention in an existing tooth.

4,547,160

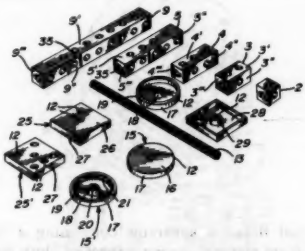
EDUCATIONAL BUILDING TOY

Richard Labelle, 132 Wellington St., Apt. 17, North Sherbrooke, Canada J1H 5C5

Filed Aug. 21, 1984, Ser. No. 643,351
Int. Cl.[4] G09B *1/40*; A63H *33/08*; A63F *9/20*
U.S. Cl. 434—195 **18 Claims**

1. An educational building toy comprising a plurality of toy blocks, of generally square cross-section and being of proportionally-graduated lengths; including a first cubic block of one-unit length, the remaining blocks each having a length

which is an integral multiple of the length of said first block; said first block being provided with a first hole extending entirely therethrough along at least one its axes; each said remaining block being provided with a number of lengthwisely equivalently spaced-apart first holes extending thereacross and opening at a first pair of opposite side faces thereof; said number of first holes corresponding with the given multiple of unit length of each of said remaining blocks; all of said holes having the same diameter; further comprising a plurality of rods of circular cross-section and made of resilient material; each said rod being formed with a plurality of axially-extending circumferentially-spaced ridges having peaks; said peaks defining an outer diameter slightly greater than the diameter of said holes, whereby said ridges will be slightly deflected when said rod is inserted into any one of said holes to provide a friction fit therebetween the end faces of each said block, including said



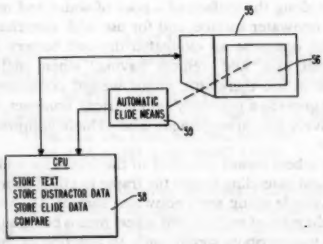
first block, being formed with second holes which communicate only with the adjacent one of said first-named holes respectively, said first block being provided with a third hole extending thereacross and normal to said first and second holes thereof, each of said remaining blocks being provided with a number of third holes extending thereacross and opening at the second pair of opposite side faces thereof; said third holes of said remaining blocks being lengthwisely staggered relative to the first holes of said remaining blocks and being one less in number, some of said rods being formed with at least one intermediate portion therealong that has none of said ridges, thereby defining a smooth outer diameter, the toy further comprising a plurality of discs having a flat first face provided with a central hole of the same diameter as the other said holes; a circumferential flange extending away from said flat face; and a hub projecting from the other face and containing said central hole.

4,547,161

APPARATUS AND METHOD FOR CLOZE-ELIDE TESTING

Winton H. Manning, Princeton, N.J., assignor to Educational Testing Service, Princeton, N.J.

Filed Mar. 8, 1984, Ser. No. 587,356
Int. Cl.[4] G09B *5/00*
U.S. Cl. 434—358 **22 Claims**



1. A Cloze-Elide automatic test system, comprising

a test sheet of predetermined dimensions and having a plurality of defined marking areas thereon arranged in rows, each said marking area having respective predetermined position on said sheet,

a text of printed words of a first optical reflectivity arranged in said rows, each said printed word defining a word position corresponding to one or more of said marking areas,

indicia of a second optical reflectivity overmarking selected ones of said words, and

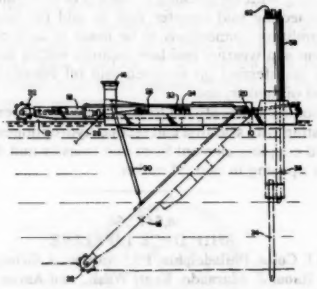
optical scanning means having different optical sensitivities to said words and said overmarking indicia, for scanning said sheet to determine the positions of said overmarked words.

4,547,162

SPUD SUPPORT FOR USE IN WATER OF EXCESSIVE DEPTH

Charles D. Little, Graceland Park, Md., assignor to Ellicott Machine Corporation, Baltimore, Md.

Continuation of Ser. No. 506,514, Jun. 21, 1983, abandoned. This application Feb. 11, 1985, Ser. No. 700,069
Int. Cl.[4] B63H *19/00*
U.S. Cl. 440—36 **9 Claims**



9. Means for anchoring a dredge barge or the like in exceptionally deep water comprising a unitary, vertically reciprocal, rotatable spud support member, a plurality of vertically reciprocal spuds carried by said spud support member, means for vertically reciprocating said support member relative to said dredge barge, means for vertically reciprocating each of said spuds relative to each other and to said spud support member, and means for rotating said support member relative to said dredge barge, said support member including a sleeve, means keying said support member to said sleeve for preventing relative rotation between said sleeve and said support member while permitting said support member to be vertically reciprocated relative to said sleeve, said sleeve being rotatable, said means for rotating said support member being operable connected to said sleeve to transmit rotary motion thereof to said support member through said keying means.

4,547,163

OIL TRANSFER APPARATUS

Rudolf Langpaap, Hamburg, and Konrad Wilke, Rosengarten, both of Fed. Rep. of Germany, assignors to LICENTIA Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 156,094, Jun. 3, 1980, abandoned. This application Jun. 4, 1982, Ser. No. 385,282
Int. Cl.[4] B63B *21/52*
U.S. Cl. 441—2 **14 Claims**

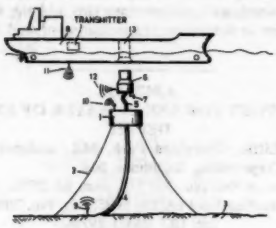
1. An oil transfer apparatus for transferring oil between an oil conveying line and an oil tanker, said oil tanker having an opening in the bottom thereof and being provided with a first hydrophone, said apparatus comprising:

a transfer unit having an opening in the top thereof, said

transfer unit including means for connecting said transfer unit to said oil conveying line;

means for anchoring said transfer unit in the sea at a predetermined depth below the surface of said sea and above the bottom thereof;

a coupling element having a second hydrophone mounted thereon, said coupling element being insertable into the opening in said oil tanker to permit access thereto within said tanker, the lower portion of said coupling element



mating with the opening in the top of said transfer unit for connecting said transfer unit to said oil tanker thereby permitting connections to be made to said coupling element at a weather resistant location within said oil tanker for transferring oil between said oil conveying line and said oil tanker; and

positioning means affixed to said coupling element and cooperating with said first and second hydrophones for moving said coupling element from said transfer unit directly into the opening in said oil tanker.

4,547,164

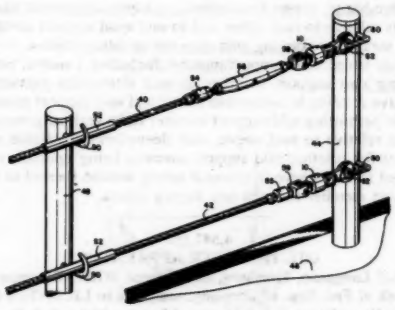
SHIP DECK LIFELINE

Russell I. Coles, Philadelphia, Pa.; Norman J. Griest, Rockville, Md.; Raoul J. Marando, Kent, Wash., and Aaron A. Suleske, Stafford, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 6, 1984, Ser. No. 577,437

Int. Cl.[4] B63C *9/00*; H01B *17/60*

U.S. Cl. 441—84 **3 Claims**



1. A ship deck lifeline for reducing electromagnetic interference with shipboard electronic equipment, comprising in combination:

a plurality of metal stanchions fastened to the ship's deck, said stanchions including end stanchions and intermediate stanchions disposed at spaced intervals between said end stanchions;

a plurality of metal cables formed for horizontal suspension from the end stanchions and supported by the intermediate stanchions;

electrical insulators connected between each end of said cables and respective ones of said end stanchions; and

electrical insulating sleeves fixed to said cables at said spaced intervals for slidably engaging said intermediate stanchions.

4,547,165

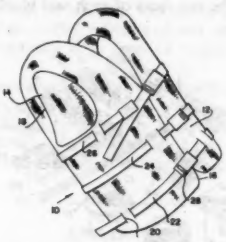
PERSONAL FLOTATION DEVICE

Stephen M. Scheurer, and Robert S. Scheurer, both of P.O. Drawer 539, Wichita Falls, Tex. 76307

Filed Jan. 21, 1983, Ser. No. 460,093

Int. Cl.[4] B63C *9/10*

U.S. Cl. 441—112 **26 Claims**



1. Personal flotation apparatus comprising a closed cell polymeric foam material having a sheet of cloth fused to the foam material using only heat and pressure having means for connecting the apparatus to the body of a wearer, the foam material having outer and inner surfaces which converge at edge portions of the foam the foam material further having curved edges, wherein the cloth material is a double-stretch material fused to at least one surface of the foam material and wherein edges of the cloth are stretched over the edge portions of the foam material and fused to the opposite surface of the foam material.

4,547,166

AMPHIBIOUS SELF-POWERED MINIATURE CAR WITH UNUSUAL CLIMBING CAPABILITY

Adolph E. Goldfarb, 1432 SE. Wind Cir., Westlake Village, Calif. 91361, and Delmar K. Everitt, Woodland Hills, Calif., assignors to Adolph E. Goldfarb, Northridge, Calif.

Continuation-in-part of Ser. No. 417,554, Sep. 13, 1982, Pat. No. 4,492,058, which is a continuation-in-part of Ser. No. 233,495, Feb. 11, 1981, abandoned, which is a continuation-in-part of Ser. No. 121,645, Feb. 14, 1980, Pat. No. 4,306,375. This application Feb. 4, 1983, Ser. No. 463,999

The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.

Int. Cl.[4] A63H *23/04, 29/02*

U.S. Cl. 446—164 **42 Claims**

1. A self-propelled amphibious miniature toy vehicle for operation along the surface of a pool of water and on a steep, irregular nonwater surface, and for use with electrical battery means that comprise an elongated dry-cell battery having a longitudinal axis; said vehicle having, when such battery means are in use therewith, major weight components positioned to provide a generally symmetrical, compact, balanced and relatively low arrangement; said vehicle comprising:

a frame;

hollow wheel means mounted to the frame for rolling rotation and extending below the frame to effect propulsion of the vehicle along such nonwater surface, the volume-to-weight ratio of each of said wheel means being sufficiently high to contribute significantly to flotation of the vehicle in water; and

an electric motor mounted to the frame and operatively

connected to drive at least one of the wheel means; and wherein:

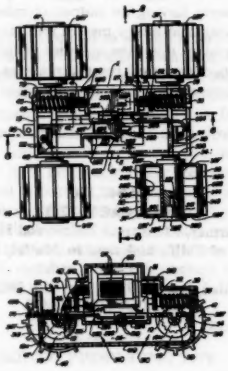
the frame defines a chassis having upright walls defining an interior compartment;

the hollow wheel means comprise hollow front wheel means and hollow rear wheel means mounted to the chassis for said rolling rotation about respective mutually parallel but spaced-apart front and rear axes, the distance between the front and rear axes being generally about two inches;

the electric motor is mounted in the interior compartment, and has a driveshaft; and

the vehicle further comprises:

means mounted in the interior compartment to releasably support such electrical battery means in the compartment with such longitudinal axis of such battery means extending substantially front-to-back of the vehicle and extending at least substantially the full distance between the front and rear axes;



means on the chassis for electrically connecting such battery means, when supported in the supporting means, to the motor, so that such battery means power the motor; and

transmission means mounted in the interior compartment and comprising a speed-reduction mechanism connecting the motor driveshaft to both said front and said rear wheel means to transmit rotation from the driveshaft to the wheel means with reduced speed and with increased power;

at least major portions of the transmission means, the motor, and such battery means, when such battery means are supported in the supporting means, being at approximately the same height as the front and rear wheel means; and

the transmission means, the motor, and such battery means, when such battery means are supported in the supporting means, substantially fully occupying the interior compartment.

4,547,167

APPARATUS AND METHOD FOR MAINTAINING ALTITUDE AND ATTITUDE OF A NEUTRAL BUOYANCY BALLOON

David E. Bergmann, 722 E. 6th St., St. Paul, Minn. 55106

Filed Jan. 24, 1983, Ser. No. 460,170

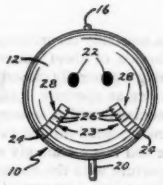
Int. Cl.⁴ A63H *3/06;* **B64C** *17/00*

U.S. Cl. 446—220 **9 Claims**

1. In an airbourne, free floating, lift-weight balanced balloon having a closed envelope encompassing a volume of lighter-than-air gas, said envelope having an outer skin defining a fixed maximum volume, which skin is substantially impervious to the passage of said gas therethrough, said balloon being generally symmetrical about a vertical plane which includes the central horizontal axis of the balloon passing through the center of balance of the balloon, said balloon being nonsymmetrical or symmetricl about any vertical plane lying at right angles to said central horizontal axis, said balloon having ballast means fixed in position with respect to the envelope to tend to balance the weight of the balloon to equal the lifting effect of the gas, and to tend to cause the balloon to float in a position such that a first trace portion of the skin of the balloon is established as a closed-loop, generally longitudinally extending trace lying in said vertical plane which includes the central horizontal axis and such that a second trace portion of the skin is established as a closed-loop, generally transversely extending trace lying in a transversely extending vertical plane passing through the center of balance of the balloon and lying at right angles to the horizontal axis of the balloon and to said vertical plane containing the first trace portion, the improvement including:

A. said ballast means including at least one ballast member adapted to be adhered to the balloon fixedly with respect to the skin of the envelope, said at least one ballast member being constituted as a plurality of weight control modules arranged symmetrically with respect to said vertical plane containing the first trace portion;

B. the positioning and weight of the modules being such that, as they are serially removed from the envelope to maintain the altitude balance of the balloon, the order of their removal can be such as to tend to maintain the first and second trace portions of the balloon skin in truly vertical planes each plane passing through the center of balance of the balloon;



C. fastening means operative to cause said modules to adhere in fixed position with respect to the skin of the envelope, and to allow said modules to be removed from said fixed position with respect to said skin; and

D. said fastening means and said ballast member constituting at least part of said ballast means.

7. A method of maintaining a desired altitude and attitude of a balloon which is generally symmetrical about a vertical plane which includes the central horizontal axis of the balloon passing through the center of balance of the balloon and which is nonsymmetrical or symmetrical about any vertical plane lying at right angles to said central horizontal axis; said balloon having ballast means initially ballasting the balloon to float at an altitude below the desired altitude and to tend to cause the balloon to float in a position such that (1) a first trace portion of the skin of the balloon is established as a closed-loop, generally longitudinally extending trace lying in said vertical plane which includes the central horizontal axis, and (2) a second trace portion of the skin is established as a closed-loop, generally transversely extending trace lying in a transversely extending vertical plane passing through the center of balance of the balloon and lying at right angles to said vertical plane containing the first trace portion; the ballast means including a plurality of removable weight control modules adhered to the skin of the balloon; the method including the steps of:

A. removing weight control modules one after another until the balloon floats at the desired altitude;

B. releasing the balloon in the air after at least one weight control module has been removed according to the previ-

ous step and allowing the balloon to move toward its attitude of balance;

C. observing any deviation in the positioning of the balloon to tend to displace the second trace portion of the balloon skin from its vertical plane passing through the center of balance of the balloon; and

D. removing subsequent weight control modules from the balloon skin from locations which will lighten a portion of the balloon which will tend to cause the balloon to float at an attitude in which the second trace portion of the balloon skin will lie in its vertical plane passing through the center of balance of the balloon.

4,547,168

INFLATABLE ASSEMBLY WITH SURFACE CLOSURE

Richard Blacksberg, and Michael S. Isaacs, both of Brooklyn, N.Y., assignors to U.S. Balloon Mfg. Co., Inc., Brooklyn, N.Y.

Filed Jun. 20, 1983, Ser. No. 505,989
Int. Cl.[4] A63H *3/06*
U.S. Cl. 446—222 **12 Claims**

1. An inflatable assembly comprising:

a. A device formed of sheet material having an external surface defining a generally closed gas receiving compartment and having an aperture in said surface for receiving a conduit associated with a source of gas;

b. closure means mounted on said external surface covering said aperture and being sealingly attached to said surface about said aperture with the exception of a zone of initial separation dimensioned to provide the gas conduit with access to said aperture, said closure means being provided with adhesive means on the surface of said zone facing said sheet material surface and said aperture; and

c. separator means disposed between said zone of said closure means and said sheet material surface to prevent premature attachment therebetween, said separator means being adapted to be removed thereby exposing said adhesive means to said sheet material surface, whereby removal of said separator means subsequent to inflation of said inflatable device and application of pressure to said closure means in the region of said zone of initial separation seals said aperture to prevent escape of gas therethrough.

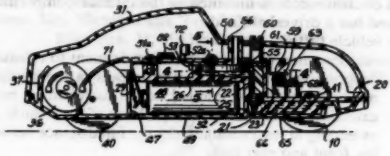
4,547,169

CONDUCTIVE FLUID ACTIVATED DEVICES

John Maxim, 25 Mill Valley La., Stamford, Conn. 06903

Continuation of Ser. No. 411,936, Aug. 26, 1982, abandoned, which is a continuation of Ser. No. 183,778, Sep. 3, 1980, Pat. No. 4,347,683. This application Dec. 13, 1984, Ser. No. 681,084
Int. Cl.[4] A63H *3/52*
U.S. Cl. 446—267 **20 Claims**

1. A toy device comprising a toy frame; propelling means supported on said toy frame for moving said toy frame along a path; motor means supported on said toy frame and operatively coupled to said propelling means for causing said propelling means to move said toy frame along a path; reservoir means carried on said toy frame capable of receiving a current conducting liquid; said reservoir means having an entrance opening through which said current conducting liquid is introduced into said reservoir means and an exit opening through which said current conducting liquid drains out of said reservoir means; a first pair of electrically conductive probe means in spaced relation in said reservoir means; and circuit means coupled to said probe means and adapted to be actuated when



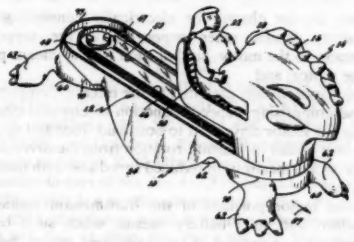
said pair of probe means are electrically coupled by said liquid, said circuit means having an output coupled to said motor means for driving said motor means, the duration of said output being dependent upon the quantity of current conducting liquid introduced into said reservoir means, whereby a toy actuated to move along a path by said liquid is produced.

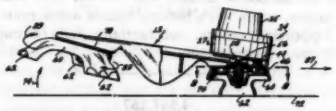
4,547,170

MOVEABLE TOY

Michael V. Gurtner, Manhattan Beach, and Herbert May, Torrance, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jan. 10, 1984, Ser. No. 569,630
Int. Cl.[4] A63H *11/00*
U.S. Cl. 446—353 **34 Claims**





1. A moveable toy comprising:

a base having two ends with a rotor means rotatably mounted at each end;

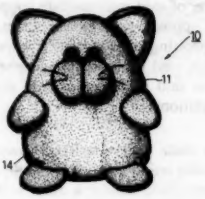
a track having two ends mounted to the base with each end adjacent a rotor means; and

a motor driven vehicle removeably mounted on the track for travel along the track when the vehicle motor is actuated, whereby when the vehicle reaches either end of the track, the base on which the track is mounted will be caused to move by the vehicle to thereby allow the moveable toy and the vehicle to continue to move in the direction the vehicle had been moving.

4,547,171
STUFFED TOY

Yukihiro Horimoto, Osaka, Japan, assignor to Young Sangyo Co., Ltd., Osaka, Japan

Filed Dec. 14, 1983, Ser. No. 561,397
Claims priority, application Japan, Aug. 25, 1983, 58-130413[U]
Int. Cl.⁴ A63H 3/02
U.S. Cl. 446—370 14 Claims

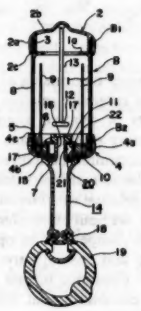


1. A stuffed toy also useful as a bag for small articles comprising an outer stuffed fabric member having an outer figure or animal configuration and an inner frame assembly removably mounted within said stuffed fabric member for receiving a light source therein, said removable inner frame assembly having power source means mounted at the lower end of said frame assembly, said inner frame assembly comprising a substantially conical light permeable frame member, a cylindrical base member and a bottom member which are detachably connected together and an opening and closing means on said outer stuffed fabric member for mounting said inner frame assembly within and removing said inner frame assembly from said stuffed fabric member to thereby convert said stuffed toy into a bag for small articles.

4,547,172
SOUND PRODUCING TOY

Moriya Kino, Yokohama, Japan, assignor to Royal Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1983, Ser. No. 536,435
Int. Cl.⁴ A63H 5/00
U.S. Cl. 446—421 4 Claims



1. A sound producing toy comprising a housing for accommodating a sound producing mechanism therein and a grip member which is secured to said housing, said housing comprises:

a cylindrical hollow drum having opposite end openings;

an upper cap including a peripheral side wall and bottom wall, said peripheral side wall being provided therein with an annular groove opening toward an annular end face thereof, an upper end portion of said drum being fixedly forced into said groove;

an annular rib inwardly extending from an inner surface of said drum at a position adjacent to said upper cap for reinforcing said drum;

a lower cap including a peripheral side wall and bottom wall, the peripheral side wall of said lower cap having therein an annular groove opening toward an annular end face thereof, a lower end portion of said drum being fixedly forced into the groove of said lower cap, said bottom wall being secured to the upper end of said grip member;

a wire holding plate fixed to the peripheral side wall of said lower cap and overlapping with said groove in said lower cap for reinforcing the lower end portion of the drum.

4,547,173
TOY VEHICLE CLAW WHEEL

Eugene Jaworski, Park Ridge, and Jeffrey D. Breslow, Highland Park, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 4, 1984, Ser. No. 678,023
Int. Cl.⁴ A63H 29/00
U.S. Cl. 446—457 20 Claims

1. A wheel and axle assembly for a toy vehicle comprising:

a hollow wheel with a peripheral wall mounted for rotation on an axle;

an opening extending through the peripheral wall;

a spider secured to the axle for rotation with the axle within the hollow wheel;

the spider having at least one leg spaced from the axle;

a claw attached adjacent one end to the leg for pivotal movement relative to the leg about an axis generally parallel to the axle forming a spider-claw subassembly;

the claw having a free end distal from the one end;

engagement between the spider-claw subassembly and the wheel;

means biasing the claw to remain within the wheel; and

rotation of the axle relative to the wheel in one direction causing the claw to be driven out through the opening upon overcoming the engagement between the spider-claw subassembly and the wheel.

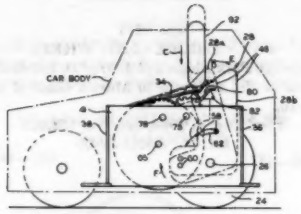
4,547,174
INERTIA MOTORS FOR TOY VEHICLES

James S. W. Lee, Long Island, N.Y.; Kwong-Wai Chow, Kowloon, Hong Kong; Alfred T. Y. Lau, and Ming-Ngar Chow, both of Hong Kong, Hong Kong, assignors to Zima Products, Ltd., Hong Kong, Hong Kong

Filed Mar. 20, 1984, Ser. No. 591,463
Int. Cl.⁴ A63H 29/24
U.S. Cl. 446—463 7 Claims

1. An inertia motor comprising a housing, an axle supported

by said housing and having a drive gear mounted thereon to turn unitarily therewith, a flywheel rotatably mounted on said housing for spinning to store or to payout energy, first and second gear trains supported by said housing and extending between said drive gear and said flywheel, lever means pivoted to move between two positions, a pair of oppositely aligned spaced parallel arcuate slots formed in said lever, said lever means carrying first and second movable gears, one of said movable gears being an idler mounted on and movable with a shaft, the shaft of said idler gear passing through said pair of oppositely aligned arcuate slots, the other of said movable gears being mounted on a shaft journaled in said lever means,



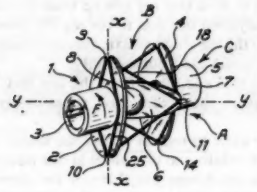
said arcuate slots being located so that said idler gear meshes with one of said gear trains when said lever means is in one of its two positions, the teeth on the gears meshing to pull said shaft to one end of said arcuate slots so that said idler moves into said one gear train when said drive gear is driving said one gear train and to push said shaft to the other end of said arcuate slots to eject said idler from said one gear train when said flywheel is driving said one gear train and said journals for the shaft of the other movable gear being located on said lever means so that said other movable gear meshes with the other of said gear trains when said lever means is in the other of its two positions.

4,547,175

TRANSMISSION JOINT

Giorgio Tangorra; Edoardo Robecchi, and Lino Magnabosco, all of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Jan. 16, 1984, Ser. No. 570,768
Claims priority, application Italy, Jan. 14, 1983, 19097 A/83
Int. Cl.[4] F16D *3/50*
U.S. Cl. 464—56 **13 Claims**



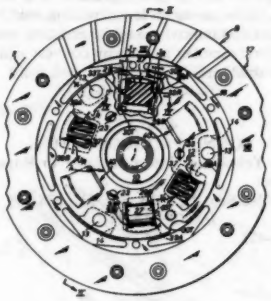
1. A joint for transmission of motion from a driving shaft to a driven shaft, comprising: (a) a driving support connected to the driving shaft, (b) a driven support connected to the driven shaft, (c) an intermediate support placed between said driving and driven supports, an axis of said driving support and an axis of said driven support lying on a plane which is perpendicular to an axis of said intermediate support, (d) flexible elements resistant to tensile stresses for relative coupling between said intermediate support and said driving and driven supports, said flexible elements comprising a first flexible element extending from one end of said driving support located on said axis of said driving support to an end of said intermediate support located on said axis of said intermediate support and a second flexible element extending from an end of said driven support located on said axis of said driven support to another end of said intermediate support, said end of said driven support being located opposite to said end of said driving support and said another end of said intermediate support being opposite to said end of said intermediate support, said first and second flexible elements being connected to said ends of said supports through hinge-type connections, and (e) centering means located in central position of said intermediate support and having portions lying on opposite parts with respect to said intermediate support, and pressing on said central parts of the driving and driven supports, said intermediate support being freely movable relative to said shafts when said shafts are disposed in non-aligned relationship.

4,547,176

TORSIONAL DAMPER

Pierre Loizeau, Ville d'Avray, France, assignor to Valeo, Paris, France

Filed Feb. 7, 1984, Ser. No. 577,719
Claims priority, application France, Feb. 21, 1983, 83 02767
Int. Cl.[4] F16D *3/12*
U.S. Cl. 464—68 **11 Claims**



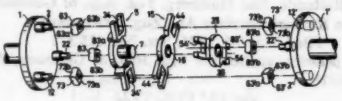
1. A torsional damper comprising at least two coaxial parts mounted so as to be rotatable relative to one another within predetermined limits of relative angular movement, staged circumferentially acting elastic means disposed between said coaxial parts in the circumferential direction and comprising at least one block of elastic material extending in a substantially tangential direction relative to a circumference of the damper and partially housed, without circumferntial clearance in a rest configuration of the damper, in an opening formed for this purpose in a first of said coaxial parts, and partially housed, with circumferential clearance in said rest configuration and for at least a first circumferential direction, in an opening formed for this purpose in a second of said coaxial parts, wherein said at least one elastic material block includes at least one integral elastic material peg projecting from the rest of the related block in said first circumferential direction even in said rest configuration, said at least one peg defining a first stage elastic means having low stiffness, the rest of said at least one block defining a second stage elastic means having higher stiffness than said first stage elastic means, said at least one elastic material peg being in contact with a corresponding radial edge of said opening in said second coaxial part, and the peg being operative as soon as there is any relative angular movement of said first and second coaxial parts.

4,547,177

KINEMATIC UNIVERSAL COUPLING

Yasuo Ueno, 17-3-209, Higashi Nogawa 3-chome, Komae-shi, Tokyo, Japan

Filed Apr. 26, 1983, Ser. No. 488,768
Claims priority, application Japan, May 2, 1982, 57-73929
Int. Cl.[4] F16D 3/04, 3/30
U.S. Cl. 464—69 4 Claims



1. A coupling between a first rotary shaft and a second rotary shaft, said coupling comprising a first plate coaxial with and rigid with said first shaft, a second plate coaxial with and rigid with said second shaft,

a floating intermediate device comprising at least three levers and a center articulation pivotally assembling said levers,

first means for connecting an end portion of each lever to said first plate, the first means including first torque transmitting elements disposed between the end portion of each lever and the first plate, means for holding said first elements on said first plate each slidably along a first axis in a direction forming a certain angle with said first plate and rotatably about said first axis, means for holding each first element on said end portion of said lever slidably along and rotatably about a second axis that extends lengthwise of the lever, said holding means comprising a first pair of spaced cylindrical surfaces on each first element and a second pair of spaced cylindrical surfaces on an assocaiated lever end portion, with both pairs of cylindrical surfaces being generated about said second axis and with the surfaces of the first pair fully contiguous with the respective surfaces of the second pair,

second means for connecting an opposite end portion of each lever to said second plate, the second means including second torque transmitting elements disposed between the opposite end portion of each lever and said second plate, means for holding said second elements on the opposite end portion of the lever slidably in the lengthwise direction thereof, and means for holding said second elements on said second plate each slidably along and axis in a direction forming a certain angle with said second plate and rotatably about said last-mentioned axis.

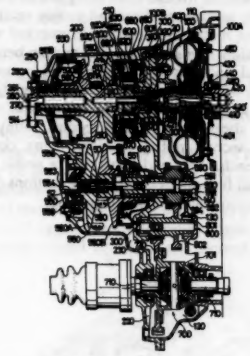
4,547,178

CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION FOR A VEHICLE

Yoichi Hayakawa; Shoji Yokoyama, and Yasunobu Ito, all of Anjo, Japan, assignors to Fuji Medical Instruments Mfg. Co., Ltd., Osaka, Japan

Filed Dec. 1, 1983, Ser. No. 556,853
Int. Cl.[4] F16H 11/06
U.S. Cl. 474—11 7 Claims

1. In a hydraulic control system for controlling automatically, in response to the running conditions of a vehicle, a belt drive continuously-variable transmission for a vehicle having an input pulley and an output pulley mounted on an input shaft and an output shaft and varied in effective diameter by a hydraulic servomotor, and a V-belt extended between said both pulleys, the control system for a belt drive continuously-variable speed automatic transmission comprising a downshift control mechanism for restricting a quantity of flow is provided on a discharge passage of a working fluid from a hydraulic servomotor of the input pulley to restrict the discharge speed of the working fluid from the hydraulic servomotor of the input pulley, thereby preventing an excessive drop of the oil pressure in the hydraulic servomotor of said input pulley produced at



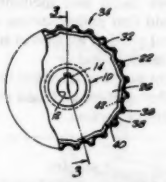
the time of the kickdown to prevent a slip between the V-belt and the pulley.

4,547,179

TIMING BELT PULLEY AND METHOD OF MANUFACTURE

Yasuo Ohhashi, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 3, 1983, Ser. No. 455,286
Claims priority, application Japan, Jan. 7, 1982, 57-1128; Jan. 7, 1982, 57-1126; Jan. 25, 1982, 57-9913
Int. Cl.[4] F16H 55/30
U.S. Cl. 474—152 15 Claims



1. A timing belt pulley comprising

a hub;

a wheel including an inner flange mating with said hub, an outer cylindrical flange having outwardly extending spaced protrusions thereabout, and a web extending outwardly from said inner flange to said outer flange; and

a cylindrical ring positioned about said outer cylindrical flange and including an inner surface, an outer surface and corrugations defining teeth in the outer surface thereof for receipt of a timing belt and recesses in the inner surface thereof for receipt of said protrusions.

4,547,180

CRANKSHAFT PULLEY OF ENGINE

Yoshimasa Hayashi, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama City, Japan

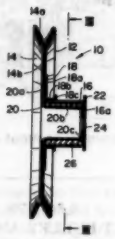
Filed Aug. 24, 1982, Ser. No. 411,020
Claims priority, application Japan, Aug. 27, 1981, 56-134709
Int. Cl.[4] F16H 55/12
U.S. Cl. 474—159 4 Claims

1. A crankshaft pulley of an internal combustion engine having a crankshaft, comprising:

a first pulley section for use with a V-belt to drive at least an engine asccessory, said first pulley section being formed of

sheet metal and including an annular groove portion over which said V-belt passes, and an annular flat portion which is perpendicular to an axis of said crankshaft;

a second pulley section for use with a cogged belt to drive a camshaft of the engine, said second pulley section being formed of sheet metal and securely connected with said first pulley section, said second pulley section being generally cylindrical and having a cylindrical outer surface with a plurality of teeth, each of said teeth extending along an axis of said cylindrical second pulley section and being formed in the sheet metal of said second pulley section, said first and second pulley sections being completely integral with each other and formed of a single blank of sheet metal, said first and second pulley sections constituting a main body of said crankshaft pulley;



first and second reinforcement members connected to said main body on opposite sides of said main body, said first reinforcement member being formed of sheet metal and including a flat portion in contact with said first pulley section annular flat portion, and a cylindrical portion in contact with an outer cylindrical surface of said second pulley section, said second reinforcement member being formed of sheet metal and including a flat portion in contact with said first pulley section annular flat portion, and a cylindrical portion located inside of said cylindrical second pulley section; and

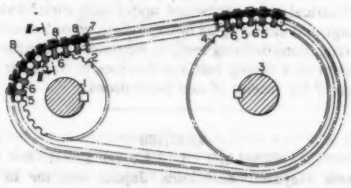
an annular resilient member disposed between said cylindrical second pulley section and said second reinforcement member cylindrical portion.

4,547,181

INTERLOCKING DRIVING BELT

Torao Hattori, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 8, 1984, Ser. No. 587,431
Claims priority, application Japan, Mar. 12, 1983, 58-40952
Int. Cl.⁴ F16G *1/28*
U.S. Cl. 474—204 **4 Claims**



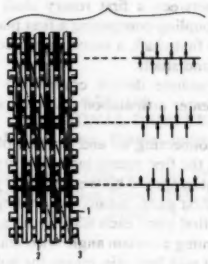
3. An interlocking driving belt wrapped around a toothed driving wheel and a toothed driven wheel to transmit power from the former wheel to the latter wheel, comprising a plurality of toothed blocks having tooth-shaped portions capable of being meshed with tooth spaces on outer circumferential surfaces of both of said wheels, a plurality of rollers held rotatably among said toothed blocks, a flat endless belt member wrapped tightly around outer circumferential surfaces of said rollers, and stopper plates fixed to said toothed blocks, each of which stopper plates contacts one of two adjacent toothed blocks to retain these two toothed blocks in predetermined positions.

4,547,182

FLAT OR PLATE LINK- ARTICULATED CHAIN, PARTICULARLY FOR USE IN STEPLESS VARIABLE-RATIO TRANSMISSIONS

Manfred Rattunde, Bad Homburg, Fed. Rep. of Germany, assignor to Reimers Getriebe AG, Zug, Switzerland

Filed May 23, 1984, Ser. No. 613,371
Claims priority, application Fed. Rep. of Germany, Jul. 6, 1983, 3324318
Int. Cl.⁴ F16G *1/22*
U.S. Cl. 474—214 **2 Claims**



1. In combination with a stepless variable-ratio double-cone transmission having facing, variably spaced conical surfaces of transmission wheels,

a flat or plate link elongated chain which, in operation of the transmission, is placed between the facing conical surfaces of the transmission wheels and engaged at lateral sides by said facing conical surfaces, said chain having

a plurality of link plates (1, 2) in which some of the link plates are positioned—transversely with respect to the chain—in parallel arrangement with respect to each other, and connected to further link plates located in longitudinal direction of the chain,

and a plurality of connecting elements (3) connecting together respectively transversely adjacently positioned link plates,

the end surfaces of the connecting elements being adapted to frictionally engage the conical surfaces of the transmission wheels and transferring forces between the conical surfaces and the chain link plates,

and wherein

the link plates (1, 2) are interconnected in a three-link arrangement in which similarly located end portions of the link plates are offset by two connecting elements (3) to provide for a transversely staggered pattern arrangement of the links which repeats for each three links; and

the link plates (1, 2) are positioned and retained in the chain by the connecting elements (3) in an arrangement wherein a connecting line through the centers of gravity of neighboring transversely adjacent link plates (1, 2) forms, throughout a major portion of its length, an essentially straight line extending across the chain and at an inclination with respect to the longitudinal direction of the chain.

4,547,183

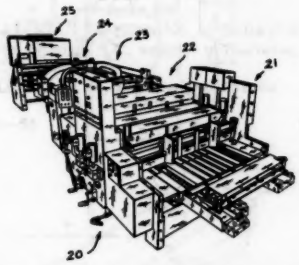
CORRUGATED BOX MACHINE

Donald E. Mowry, Norwalk, Ohio, assignor to Don Mowry Flexo Parts, Inc., Norwalk, Ohio

Filed Nov. 18, 1982, Ser. No. 442,611
Int. Cl.⁴ B31B *1/58*
U.S. Cl. 493—182 **5 Claims**

1. In a corrugated box machine having a gluing apparatus,

folding apparatus and delivery apparatus, said corrugated box machine including at least two conveyor belt assemblies, each assembly having an upper and lower conveyor belt, an upper and lower forward drive pulley, an upper and lower rearward pulley, an auxiliary pulley mounted forward of said lower forward drive pulley, a mounting bracket positioned above said auxiliary pulley, means for retaining said mounting bracket apart from said auxiliary pulley and elevator means for lifting the edge of a discharging corrugated box upwardly;



the invention comprising an improved delivery apparatus, said lower belt extending about said auxiliary pulley, an idler guide assembly pivotally mounted above said auxiliary pulley, a support means positioned intermediate said conveyor belt assemblies for supporting boxes being transported, force means for applying force to said lower conveyor belt, means for rotating said upper conveyor belt at a faster speed relative to said lower conveyor belt and bias means for applying a downward force to boxes passing between said idler guide assembly and said lower conveyor belt assembly.

4,547,184

DELIVERY MECHANISM FOR PAPER SHEET PROCESSING APPARATUS

Earnest B. Bunch, Jr., Phoenix, Ariz., assignor to B. Bunch Company, Inc., Phoenix, Ariz.

Continuation-in-part of Ser. No. 412,392, Aug. 30, 1982, abandoned. This application Jun. 13, 1983, Ser. No. 503,424

The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.

Int. Cl.[4] B65H *45/20*

U.S. Cl. 493—414 **3 Claims**

1. In combination with apparatus for producing continuous form stationery by folding a strip of paper along transverse lines of weakening formed therein, said strip of paper including a pair of generally opposed parallel outer edges, said transverse lines of weakening generally spanning said strip of paper between said outer edges and having a length generally equivalent to the shortest distance between said outer edges of said paper strip, said apparatus including

a frame,

distribution means mounted on said frame for alternately dispensing transverse lines of weakening in said paper in substantially opposite directions, and

feed means carried on said frame for directing said continuous strip of paper into said distribution means,

delivery means for receiving paper dispensed by said primary distribution means, said delivery means including

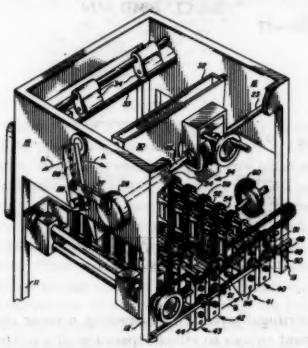
(a) first endless belt means including at least one moving endless belt having an outer peripheral surface including outwardly projecting feet connected to and spaced therealong; and

(b) second endless belt means spaced apart from and in generally opposed, parallel relation to said first endless belt means by a distance generally equivalent to said length of each transverse line of weakening, said second endless belt means including at least one moving endless belt having an outer peripheral surface including outwardly projecting feet connected to and spaced therealong,

said first and second endless belt means being positioned on said frame and operatively associated with said distribution means

(c) to receive therebetween paper dispensed by said distribution means and carry said dispensed paper away from said distribution means;

(d) to cooperate with said distribution means to fold said dispensed paper along selected ones of said lines of weakening to produce a zig-zag stack of paper having a plurality of creased edges between and generally spanning the distance between said first and second endless belt means, said stack having a top portion and a bottom portion, each of said opposed parallel outer edges of said strip of paper in said folded zig-zag stack thereof generally contacting



said outer peripheral surface of at least one of said endless belts carried by said first and second endless belt means;

(e) such that paper dispensed by said distribution means generally initially moves

(i) between said first and second endless belt means and contacts said top portion of said stack of paper, and

(ii) in a general direction of travel away from said distribution means,

while being distributed on said top portion of said zig-zag stack of paper to form said creased edges and contact each of said opposed outer edges with at least one of said endless belts of said first and second endless belt means, said movement of said dispensed paper between said first and second endless belt means controlling the movement of said paper and facilitating the folding of paper by said apparatus,

said feet being shaped, contoured and dimensioned to maintain

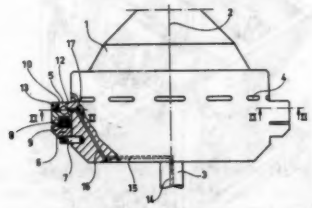
each of said generally opposed outer edges of said zig-zag stack of paper contacting said outer peripheral surface of one of said endless belts of said first and second endless belt means in a generally fixed position with respect to said outer peripheral surface of said endless belt.

4,547,185

BALANCING OF CENTRIFUGE ROTORS

Otto E. Hellekant, Rönninge, Sweden, assignor to Alfa-Laval Separation AB, Tumba, Sweden

Filed Aug. 27, 1984, Ser. No. 644,384
Claims priority, application Sweden, Sep. 13, 1983, 8304901
Int. Cl.[4] B04B *9/14*
U.S. Cl. 494—37 **8 Claims**



1. A centrifugal separator comprising a rotor operable by rotation about an axis to effect separation of a mixture within the rotor, the rotor having an annular channel concentrically surrounding said axis, at least two balancing bodies separately movable in said channel, said bodies being freely movable along the channel to different locations for balancing the rotor against the action of undesired centrifugal forces caused by the center of gravity of the rotor being displaced from said axis, arresting means rotatable with the rotor and movable axially thereof between a first position in which said bodies are freely movable along the channel and a second position in which said bodies are held against movement along the channel, and control means operable at will during rotation of the rotor at a constant speed to move the arresting means back and forth between said two positions.

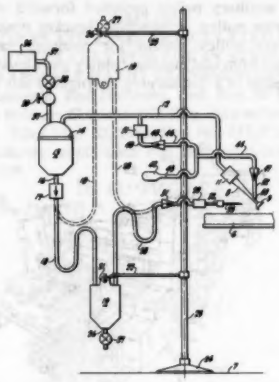
4,547,186

AUTOTRANSFUSION SYSTEM

Robert H. Bartlett, 3870 Waldenwood, Ann Arbor, Mich.

Filed Mar. 7, 1983, Ser. No. 472,763
Int. Cl.[4] A61M *1/00, 4/00*
U.S. Cl. 604—4 **13 Claims**

1. An autotransfusion system for a patient who is located at a predetermined elevation comprising a reservoir at a fixed elevation, approximately at said predetermined elevation, a flexible expansible and contractible blood bag, means for supporting said blood bag in one position at a relatively low elevation below said fixed elevation, means for supporting said blood bag in an alternative position at a relatively high elevation above said predetermined elevation, means for conducting fluid from the location of said patient to said reservoir, first flexible means continually connected to said blood bag for delivering said conducted blood from said reservoir to said blood bag at said relatively low elevation, second flexible means continually connected to said blood bag for discharging blood from said blood bag at said relatively high elevation



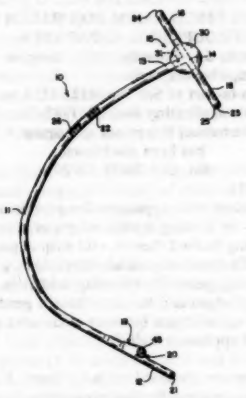
substantially to said patient and valving means in said first and second flexible means for preventing backflow of blood.

4,547,187

INFLATABLE CHOLANGIOCATH AND METHOD FOR CHOLANGIOGRAPHY THEREWITH

Thomas R. Kelly, Akron, Ohio, assignor to Thomas R. Kelly, M.D., Inc., Akron, Ohio

Filed May 6, 1983, Ser. No. 492,134
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—49 **28 Claims**



1. An inflatable cholangiocath for use in roentgenography comprising:

elongate shaft means having a proximal and a distal end and a body wall;

second shaft means of substantially equal diameter to said elongate shaft means and carried at said distal end thereof having a body wall and left and right branches adapted to be inserted into an incised duct of a patient;

a central drainage lumen extending from said proximal end, through said elongate shaft, and out said left and right branches;

balloon means encompassing a portion of said distal end and said left and right branches, said balloon means being closed to said central drainage lumen; and

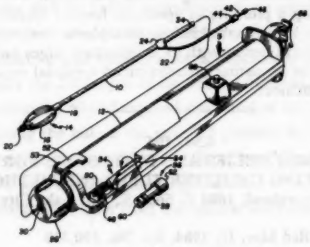
means for selectively inflating and deflating said balloon means within the duct for predetermined periods of time;
wherein said balloon means is generally spherical when inflated;
is inflatable to a diameter of at least three times the diameter of said elongate shaft and second shaft means;
conforms to the diameter of said elongate shaft and second shaft means when deflated and
can be removed from the common bile duct and the patient without surgery.

4,547,188

MATERIAL DISPENSING APPARATUS

Lee R. Bolduc, Raleigh, N.C., assignor to BioNexus, Inc., Raleigh, N.C.

Filed Nov. 14, 1983, Ser. No. 551,058
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—55 **17 Claims**



1. In apparatus for dispensing material into the Fallopian tubes of a female primate, the apparatus including expandable means positionable in the uterine cavity and adapted to be enlarged to substantially fill the cavity, probe means carrying the expandable means at one end thereof and including first and second conduits, housing means carrying material dispensing control means and expansion control means, the latter means being operatively associated with the first of the probe conduits for operating the expandable means, the housing means being adapted to receive an ampule of the material to be dispensed and including means for transferring the material from the ampule to the second of the probe conduits for delivery of the material to the uterine cavity via the probe means, the transferring means being operatively associated with the material dispensing control means, the improvement comprising disposable probe means adapted for being selectively connected to the housing means and wherein the material transfer means is external to the housing means and extends externally of the housing means from an attachment point on the probe means to the ampule and the dispensing control means.

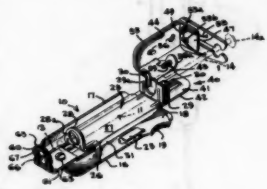
4,547,189

INSULIN SYRINGE INJECTOR APPARATUS WITH AUTO-ASPIRATOR FEATURE

Paul C. Moore, Jr., Matoaca, Va., assignor to John A. Long, Petersburg, Va., a part interest

Filed Mar. 5, 1984, Ser. No. 587,171
Int. Cl.[4] A61M *5/20*
U.S. Cl. 604—136 **20 Claims**

1. An auto-aspirating hypodermic syringe supporting and operating device for self-administered injection of hypodermic medication, insulin or the like, the hypodermic syringe including a barrel, a plunger projecting from a rear end thereof having a smaller diameter shaft portion and an enlarged head, and a needle projecting from a front end of the barrel; the device comprising an elongated thin main plate member having longitudinal slots, a carriage assembly slidably mounted on said plate member for reciprocative longitudinal movement through projecting and retracting strokes, said carriage assembly including a spring biased syringe carrier member slidably carried against one face of the plate member and having front and rear holder portions projecting therefrom to removably receive and hold end portions of the barrel and a back member fixed to said syringe carrier member by fastener tabs extending through said slots to slide longitudinally with said carrier member, a pivoted latch trigger member pivoted on said plate member having a finger operated trigger portion and a latch formation to latch the carriage assembly in a cocked position, a stop supporting bracket extending from said plate member alongside the plunger path having movable stop members



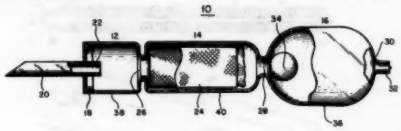
extending therefrom in a plane perpendicular to the plunger path, and stop positioning means on said bracket for disposing said stop members at a head-intercepting first position near the plunger shaft between the head formation and said barrel when the plunger is retracted to predetermined dosage position and locating the stop members at an open second position admitting passage of said head therebetween, the stop members being spaced from carrier member when adjusted for the proper dosage to engage said head and cause relative short retracting movement of the plunger during the terminal portion of said projecting stroke to cause withdrawal of blood into the syringe barrel if the tip of the needle is lodged in a vein.

4,547,190

INLET BLOOD FILTER ASSEMBLY

Hayden L. Leason, Humacao, P.R., assignor to Filtertek, Inc., Hebron, Ill.

Filed Nov. 26, 1982, Ser. No. 444,840
Int. Cl.[4] A61M *5/14*
U.S. Cl. 604—185 **9 Claims**



1. An integral inlet blood filter assembly comprising:
a drip chamber including wall members;
a filter chamber including wall members; and
a pump chamber, the pump chamber having wall members which are thinner than the drip chamber wall members and the drip, filter and pump chambers being so arranged and constructed that blood flows from the drip chamber into the filter chamber and then into the pump chamber;
wherein the drip chamber wall members, filter chamber wall members, and pump chamber wall members are all formed from a single piece of thermoplastic material.

4,547,191

MEDICAL SOLUTION TRANSFUSION CIRCUIT

Toshiji Ichikawa, Tokyo; Yoshinori Ohhachi, Kawasaki, and Zensho Kanda, Yamanashi, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1984, Ser. No. 640,386
Claims priority, application Japan, Aug. 24, 1983, 58-153072
Int. Cl.[4] A61M *5/16*
U.S. Cl. 604—251 14 Claims

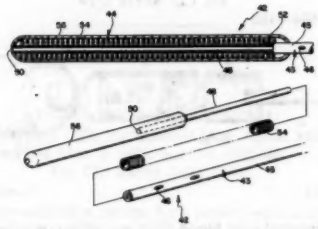
1. A medical solution transfusion circuit having a transparent cylindrical pumping body, a hard cap mounted on at least one end of said transparent cylindrical pumping body, and a flexible tube for communicating with said transparent cylindrical pumping body to transport a medical solution, wherein said transparent cylindrical pumping body comprises a propylene-/α-olefin copolymer.

4,547,192

GASTROENTERIC FEEDING TUBE

David L. Brodsky, Providence, and Harry O. Olsen, Jr., Warwick, both of R.I., assignors to Superior Plastic Products Corp., Cumberland, R.I.

Continuation-in-part of Ser. No. 441,362, Nov. 12, 1982, abandoned. This application Apr. 11, 1983, Ser. No. 484,413
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—270 4 Claims



1. A gastroenteric feeding tube comprising:
a. an elongated flexible tubular member;
b. a resiliently flexible coil spring weighting elements; and
c. means encasing said weighting element and securing it in substantially aligned relation on an end of said tubular member, said tubular member extending substantially coaxially through said weighting element and having an open terminal end, whereby a continuous open longitudinal passage is provided in said feeding tube.

4,547,193

CATHETER HAVING EMBEDDED MULTI-APERTURED FILM

Mark A. Rydell, Excelsior, Minn., assignor to Angiomedics Incorporated, Plymouth, Minn.

Filed Apr. 5, 1984, Ser. No. 596,920
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—282 7 Claims

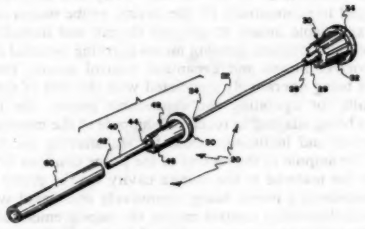
1. An improved intravascular catheter comprising a flexible, plastic tubular member having at least one lumen, a thin film member having a plurality of apertures formed therethrough and said film being embedded in said plastic and wrapped about said central lumen with its longitudinal edges butted to one another for imparting predetermined torsional rigidity to said tubular member.

4,547,194

HUB ASSEMBLIES AND EXTENSIONS FOR INDWELLING CATHETER TUBES AND METHOD

Harvey R. Moorehead, 1694 E. 5685 S., Salt Lake City, Utah 84121

Filed Mar. 16, 1984, Ser. No. 590,310
Int. Cl.[4] A61M *25/00*
U.S. Cl. 604—283 15 Claims



1. A method of integrally adding a hub at the trailing end of an indwelling hollow pliant catheter tube comprising the steps of:

providing, at a point in time after the proximal end of a catheter tube has become indwelling within a patient so that the distal end of catheter tube is exposed outside the patient, a separate structure for insitu formation of a hub on the distal end of catheter tube;

causing the separate structure to include a short rigid essentially non compressible hollow shaft, with a trailing hollow hub attached thereto, concentrically telescopically superimposed over a trailing portion of an elongated flexible anti-buckling hub stylet, the stylet having a length substantially greater than the length of the hollow shaft and an outside diameter less than the inside diameter of the catheter tube, and the hollow shaft having an outside diameter slightly greater than the inside diameter of the catheter tube;

advancing the elongated flexible stylet into the hollow interior of the exposed end of the indwelling pliant catheter tube in essentially concentric fashion, the stylet (a) preventing the catheter tube from collapsing and buckling due to applied external forces, (b) causing an initial sub-

stantial concentricity between the stylet and the catheter tube, and (c) bringing the leading edge of the hollow shaft into essentially aligned, contiguously abutting relationship with the exposed distal end edge of the indwelling catheter tube;

advancing the stylet further into the indwelling catheter tube and simultaneously forcibly alignedly advancing the hollow shaft into the exposed end and along the interior of the catheter tube without material trauma to the patient thereby dilating the distal end of the indwelling catheter tube counter to the forces comprising the memory of the material from which the catheter tube is made, while preventing the collapsing and buckling of the catheter tube and retaining said substantial concentricity and essential alignment notwithstanding the axial advancement force and the radial enlargement force imposed upon the distal end of indwelling catheter tube;

terminating said simultaneous advancement when substantially the full length of the hollow shaft has been force fit within the dilated exposed distal end of the catheter tube;

retaining the hub in the installed position by reason of the compressive memory force of the dilated distal end of the catheter tube upon the short rigid shaft;

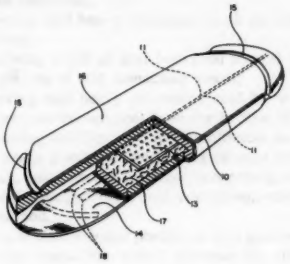
removing the stylet from the hollow shaft and the hub.

4,547,195

SANITARY NAPKIN WITH MALODOR COUNTERACTANT MEANS

David M. Jackson, Gwinnett County, Ga., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jul. 26, 1982, Ser. No. 401,483
Int. Cl.[4] A61F *13/16*
U.S. Cl. 604—359 **3 Claims**



1. A sanitary napkin comprising a folded absorbent batt as the major absorbent component of said napkin, a fluid impermeable baffle attached to one outer surface of said batt and a fluid previous cover attached to the other outer surfaces of said batt, said absorbent batt having a malodor counteractant means disposed in at least one of said folds.

4,547,196

PROCESS FOR FIXING DIRECT AND REACTIVE DYESTUFFS ON CELLULOSIC FIBERS WITH ADDITION OF MAGNESIUM SALT AND ZIRCONIUM SALT TO FIXING AGENT

Jean Balland, Chateaurenault, France, assignor to Societe Anonyme dite Manufacture de Produit Chimiques Protex, Paris, France

Filed Feb. 13, 1984, Ser. No. 579,703

Claims priority, application France, Feb. 11, 1983, 83 02873

Int. Cl.[4] D06P *5/10, 1/67, 3/66*

U.S. Cl. 8—496 **9 Claims**

1. In a process for the fixation of a dye wherein a direct or reactive dyestuff is used to dye cellulosic fibers and wherein a magnesium salt is employed during the fixation process, the improvement which comprises the step of adding to a conventional fixating agent, a zirconium salt present in an amount of between 1 and 95% by weight of the fixating agent.

4,547,197

TREATMENT OF BRINE ELUTRIATE

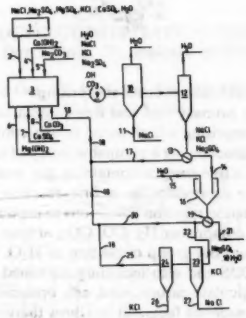
Robert Winkler, Wallisellen, Switzerland, assignor to Sulzer-Escher Wyss Ltd., Zurich, Switzerland

Filed Dec. 7, 1983, Ser. No. 559,101

Claims priority, application Switzerland, Dec. 23, 1982, 7518/82

Int. Cl.[4] B01D *9/02*

U.S. Cl. 23—302 T **6 Claims**



1. In a method of treating sodium chloride brine wherein crude brine containing sodium sulphate and potassium chloride is purified by dissolving out some of the salts with water, the thus purified brine containing sodium sulphate and potassium chloride is subjected to evaporation at elevated temperature to precipitate sodium chloride, and the precipitated sodium chloride is separated from the hot brine elutriate, the improvement which comprises a technique for extracting sodium chloride from the hot elutriate which includes the steps of cooling the hot elutriate to a lower temperature to simultaneously crystallize sodium chloride, sodium sulphate and potassium chloride and yield a parent solution still containing those salts; separating said crystallized salts from the parent solution; and feeding parent solution freed of said separated salts back to incoming brine which is to be evaporated.

4,547,198

METHOD FOR DISCHARGING TREATED COAL AND CONTROLLING EMISSIONS FROM A HEAVY OIL SPRAY SYSTEM

James L. Skinner, Tucson, Ariz., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 29, 1984, Ser. No. 594,652

Int. Cl.[4] C10L *5/24, 5/22*

U.S. Cl. 44—1 R **6 Claims**

1. In a method for intimately contacting a dried low rank coal with a heavy oil to reduce the tendency of said dried coal to spontaneously ignite, said method consisting essentially of:

(a) charging said coal to a heavy oil mist zone in a contacting vessel so that said coal falls through said mist zone;

(b) injecting finely dispersed droplets of said heavy oil and an atomizing gas into said contacting vessel to maintain a mist of said heavy oil in said mist zone;

(c) intimately contacting said coal and said mist to absorb a sufficient quantity of said heavy oil onto said coal to produce a heavy oil-treated coal as said coal falls through said mist zone; and,

(d) recovering said heavy oil-treated coal; an improvement comprising:

(e) maintaining a bed of said heavy oil treated coal in the lower portion of said contacting vessel;

(f) recovering said heavy oil-treated coal by withdrawing said heavy oil-treated coal from the bottom of said bed;

(g) maintaining said bed at a depth sufficient to remove at least a major portion of said heavy oil mist from gaseous materials, said gaseous materials comprising said atomizing gas discharged from said contacting vessel through said bed; and,

(h) passing at least a major portion of said gaseous materials from said contacting vessel downwardly through said bed.

4,547,199

USE OF ARALKYL POLYALKYLENE GLYCOL ETHERS FOR THE PREPARATION OF AQUEOUS COAL SLURRIES

Günther Boehmke, Leverkusen; Jan Mazanek, Cologne; Hans-Jürgen Botsch, and Gottfried Schneider, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

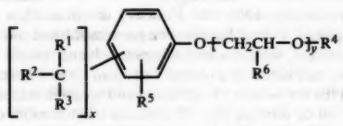
Filed Mar. 10, 1983, Ser. No. 473,898

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1982, 32403097

Int. Cl.[4] C10L *1/32, 1/18*

U.S. Cl. 44—51 **33 Claims**

1. An aqueous coal slurry containing an aralkyl polyalkylene glycol ether of the formula:



in which

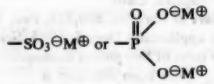
R^1 represents an optionally substituted aryl radical,

R^2 and R^3 are identical or different and denote hydrogen, alkyl or optionally substituted aryl,

x represents a number in the range from 1 to 3,

y represents a number in the range from 1 to 500, and

R^4 denotes hydrogen or one of the radicals



ps in which

$M^{+\oplus}$ represents a metal ion or ammonium,

R^5 denotes hydrogen, alkyl or optionally substitued aryl and

R^6 denotes hydrogen or alkyl, it being possible for the radicals R^6 in ne individual chain members of the polyalkylene glycol chain to be identical or different.

16. An aqueous coal slurry according to claim 1, wherein said coal has a particle size of less than 300 microns.

18. An aqueous coal slurry according to claim 1, wherein the

viscosity of said slurry is in the range of 2 to 5000 mPa.s at a shear rate of 225 s^{-1}.

4,547,200

SLURRY COMPOSITION OF SOLID FUEL

Hironobu Shinohara; Kiyonobu Kubota, and Yoshinori Yoshida, all of Tokyo, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1984, Ser. No. 664,960

Claims priority, application Japan, Oct. 31, 1983, 58-204242; Nov. 2, 1983, 58-206391

Int. Cl.⁴ C10L *1/32*

U.S. Cl. 44—51 **9 Claims**

1. A slurry composition, comprising:

(a) from 50 to 90% by weight of a powdered solid fuel in said slurry, (2) water, and (3) from 0.01 to 10% by weight of a dispersing agent consisting of a compound or polymer having in its molecular structure a tricyclodecane or tricyclodecene skeleton and a sulfonic acid group attached to the skeleton.

4,547,201

SRC RESIDUAL FUEL OILS

Krishna C. Tewari, Whitehall, and Edward P. Foster, Macungie, both of Pa., assignors to International Coal Refining Co., Allentown, Pa.

Filed Dec. 14, 1983, Ser. No. 561,388

Int. Cl.⁴ C10L *1/32*

U.S. Cl. 44—51 **8 Claims**

1. A homogeneous, single phase blend of fuel oil having long term viscosity stability consisting essentially of a blend of: (1) deashed solvent refined coal selected from the group consisting of a first-stage deashed 850° F.+ coal (SRC), a first-stage critical solvent deashed 850° F.+ coal (HSRC) and a two-stage liquefaction deashed 850° F.+ coal (TSL SRC) with (2) a distillate oil selected from the group consisting of a first-stage 400°–650° F. middle distillate oil, a first-stage 650°–850° F. heavy distillate oil, a first-stage 450°–850° F. coal liquefaction derived solvent, a second stage 400°–650° F. middle distillate oil, a second-stage 650°–850° F. heavy distillate oil, a second stage 450°–850° F. coal liquefaction process solvent and combinations thereof, wherein said selected solvent refined coal is present in said blend in a quantity of from 40 to 50 weight % based on the the weight of said blend and wherein said selected distillate oil or mixture thereof contains a heteroatom content of at least about ½ of the heteroatom content of said selected solvent refined coal.

4,547,202

HYDROCARBON OILS WITH IMPROVED POUR POINTS

Richard F. Miller, Humble, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 350,921, Feb. 2, 1982, Pat. No. 4,419,106. This application Dec. 5, 1983, Ser. No. 558,088

The portion of the term of this patent subsequent to Dec. 6, 2000, has been disclaimed.

Int. Cl.⁴ C10L *1/18*

U.S. Cl. 44—62 **11 Claims**

1. An oil composition comprising a hydrocarbon oil and a pour depressing amount of a copolymer of about 10 to 90 parts by weight of alkyl acrylate units containing about 8 to 30 alkyl carbon atoms and about 90 to 10 parts by weight of vinylidene olefin units having at least 16 carbon atoms per 100 parts by weight of copolymer, said copolymer having a weight average molecular weight of about 1,000 to 100,000.

4,547,203

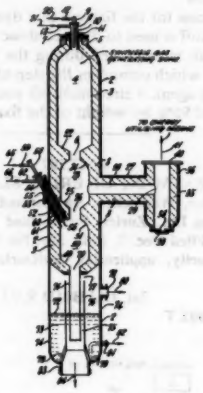
PARTIAL OXIDATION PROCESS

Frederick C. Jahnke, Rye, N.Y., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Mar. 30, 1984, Ser. No. 595,103

Int. Cl.⁴ C10J *3/46*

U.S. Cl. 48—197 R **12 Claims**



1. A partial oxidation process comprising:

(1) reacting a primary fuel and free-oxygen containing gas mixture comprising a high metal or ash containing liquid hydrocarbonaceous or a pumpable slurry of solid carbonaceous fuel, a free-oxygen containing gas, and optionally a temperature moderator in a first reaction zone under partial oxidation reaction conditions to produce a first raw gas stream comprising H_2, CO, CO_2, at least one material selected from the group consisting of H_2O, N_2, A, CH_4, H_2S and COS and also including entrained matter comprising particulate carbon, soot, ash, optionally unreacted solid carbonaceous fuel, and mixtures thereof;

(2) splitting the raw gas stream from (1) in a gas splitting zone into a first split gas stream comprising about 10–95 volume % of the total raw gas stream and a second split gas stream comprising the remainder;

(3) cooling the first split gas stream from (2);

(4) optionally cleaning the gas stream from (3) by direct contact with a scrubbing fluid to produce a clean gas stream and a dispersion of said entrained matter;

(5) reacting by partial oxidation a secondary fuel and free-oxygen containing gas mixture comprising a free-oxygen containing gas, a pumpable slurry of entrained matter from (7) and optionally a temperature moderator; wherein said partial oxidation reaction takes place downstream from said first partial oxidation reaction zone and in a reducing atmosphere that includes said second split gas stream, and producing thereby a third raw gas stream comprising H_2, CO, CO_2, at least one material selected from the group consisting of H_2O, N_2, A, CH_4, H_2S and COS, and containing entrained matter;

(6) quench cooling and cleaning by immersion in a quench fluid and optionally scrubbing the third raw gas mixture from (5), thereby producing a clean gas stream saturated with quench fluid, and a dispersion of entrained matter; and

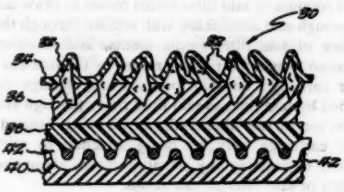
(7) concentrating the dispersion of entrained matter from (6) and optionally (4) if any to produce a pumpable slurry.

4,547,204

RESIN SYSTEMS FOR HIGH ENERGY ELECTRON CURABLE RESIN COATED WEBS

Lawrence D. Caul, Buffalo, N.Y., assignor to Carborundum Abrasives Company, Niagara Falls, N.Y.

Division of Ser. No. 195,030, Oct. 8, 1980, Pat. No. 4,457,766.
This application Jun. 6, 1984, Ser. No. 617,686
Int. Cl.[4] C09K *3/14*
U.S. Cl. 51—298 11 Claims



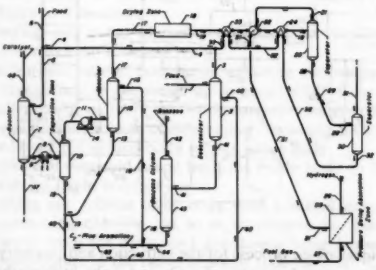
1. A coated abrasive having at least one each of a back, a base, a make and a size layer wherein at least one layer comprises an electron radiation curable resin system comprised of an urethane acrylate resin or epoxy acrylate resin, and at least one layer comprised of a heat curable phenolic resin, heat curable acrylate latex resin or mixture thereof.

4,547,205

DEHYDROCYCLODIMERIZATION PROCESS

Paul C. Steacy, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 11, 1984, Ser. No. 659,924
Int. Cl.[4] B01D *53/04*
U.S. Cl. 55—25 12 Claims



1. A process for the recovery of hydrogen from a vapor phase stream derived from a reactor effluent of a hydrogen producing hydrocarbon conversion process which comprises the steps of:

(a) compressing a vapor phase first process stream which comprises hydrogen and C_1 to C_3 hydrocarbons;

(b) forming a vapor phase second process stream comprising hydrogen and methane and a liquid phase third process stream comprising propane by partially condensing the first process stream by cooling through indirect heat exchange against coolant media followed by vapor-liquid separation;

(c) flashing the third process stream to a substantially lower pressure and thereby forming a vapor phase fourth process stream, which comprises methane, and a liquid phase fifth process stream, which comprises propane;

(d) employing the fifth process stream as at least a portion of the coolant media used to cool the first process stream;

(e) removing the fourth and the fifth process streams from the process; and

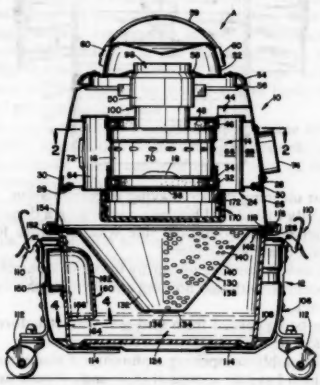
(f) passing the second process stream into a pressure swing adsorption zone in which hydrocarbons are selectively adsorbed onto a solid adsorbent at an elevated pressure and released at a substantially lower pressure and thereby forming a hydrogen-rich effluent stream and a sixth process stream, which comprises ethane.

4,547,206

VACUUM CLEANER

John F. Sovis, Coldwater, Mich., and John A. Balch, Bay Village, Ohio, assignors to Royal Appliance Mfg. Co., Highland Heights, Ohio

Filed Jun. 22, 1983, Ser. No. 506,727
Int. Cl.[4] B01D *47/02*
U.S. Cl. 55—255 15 Claims



1. A vacuum cleaner construction comprising an upper housing and a lower housing,

said upper housing including a side wall and a top dome, a bypass type blower motor having a fan chamber for generating working air, a working air inlet port and a working air outlet port, a lower motor support assembly and an upper motor support assembly, said lower motor support assembly including a lower mounting plate facing said lower housing; said upper housing further including a baffle ring extending between said upper and lower motor support assemblies and about said fan chamber and having a working air exhaust port; said side wall including a working air outlet aperture spaced 180° from said baffle ring exhaust port,

said fan chamber including a main bearing supporting a fan shaft, a sealing air fan mounted to said shaft, a sealing baffle ring about said fan shaft being spaced slightly from said fan shaft for air passage therebetween and further being spaced from said main bearing, said sealing baffle ring being generally contiguous to said sealing air fan, and a sealing air inlet port disposed apart from said working air inlet and outlet ports whereby upon operation of said sealing air fan said main bearing is air pressure sealed against the working air;

said lower housing including a separator element and a bottom pan assembly mounted to a lower housing dolly assembly, said bottom pan assembly including a working air inlet aperture and an associated deflector, said separator element being generally interposed between said bottom pan assembly and said fan chamber;

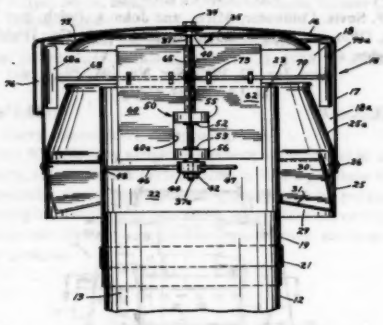
said upper housing and said lower housing including mating rim portions for sealing clamped engagements therebetween,

whereby upon operation of said vacuum cleaner, noise from said motor, fan and separator is reduced, and said main bearing is protected against working air contaminants.

4,547,207
AIR CLEANING DEVICE

Ross T. Petersen, 18500 32nd Ave. North, Plymouth, Minn. 55447

Filed Jul. 25, 1984, Ser. No. 634,294
Int. Cl.[4] B01D *45/12*
U.S. Cl. 55—394 1 Claim

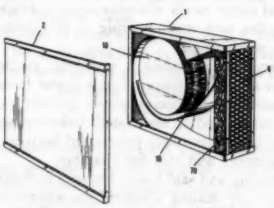


1. An air cleaning device, having in combination
a substantially cylindrical housing comprising a dome member and a depending cylindrical side wall structure forming a separation chamber therein,
a tubular sleeve extending upwardly into said separation chamber concentric with said housing and forming therein a clean air passage,
said sleeve being spaced from said side wall structure to form an outside air inlet passage therebetween,
a spinner assembly comprising a plurality of blades supporting arms which have air scoops at their ends, means suspending said spinner assembly axially of said sleeve,
an annular open-ended skirt structure having its lower portion engaging and depending below said housing member and having its upper portion tapered extending to be substantially co-planar with the top of said sleeve and thus forming therein an elongated confining air inlet passage,
a vane assembly disposed about said sleeve within said air inlet passage and within the lower end portion of said skirt structure,
said air scoops being disposed between said upper portion of said skirt structure and said wall structure, and
discharge means in said side wall structure open to the atmos

4,547,208
FLUID PROPELLING AND FILTERING APPARATUS WITH REMOVABLE FILTER CARTRIDGE

Jon R. Oace, Portland, Oreg., assignor to Research Industries, Inc., Portland, Oreg.

Filed Apr. 27, 1983, Ser. No. 489,112
Int. Cl.[4] B01D *45/00*
U.S. Cl. 55—400 16 Claims

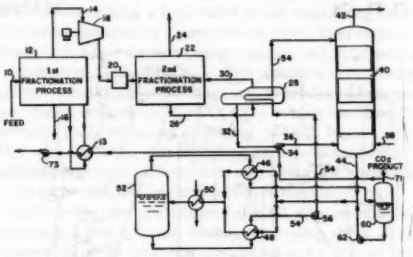


10. A filter cartridge for simultaneously imparting motion to a fluid and extracting foreign particles carried by said fluid under the impetus of means for driving said cartridge in rotation around its geometrical axis comprising:
a disc-shaped bottom wall having means for removably securing said cartridge to said driving means;
an annular top wall; and
pleated, annularly-configured filter media means disposed between and attached to said walls (1) for securing said bottom wall to said top wall in parallel, spaced relation, the outer periphery of said walls defining the circumference of a cylinder, (2) for imparting motion to said fluid upon rotation of said filter media means to draw said fluid in through said annular top wall and out through the outer surface of said filter media means, said rotation being imparted to said filter media means by the rotation of said filter cartridge, and (3) for extracting foreign particles carried by said fluid as said fluid flows through said filter media means, said filter media means being retained in said filter cartridge only by being attached to said walls thereby eliminating any retention means about the outer surface of said filter media means.

4,547,209
CARBON DIOXIDE HYDROCARBONS SEPARATION PROCESS UTILIZING LIQUID-LIQUID EXTRACTION

David Netzer, Houston, Tex., assignor to The Randall Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 583,467, Feb. 24, 1984, abandoned. This application Jul. 30, 1984, Ser. No. 635,786
Int. Cl.[4] F25J *3/00*
U.S. Cl. 62—17 11 Claims



1. A liquid phase process for the extraction and recovery of CO_2 from a liquid mixture of CO_2 and light hydrocarbons containing at least 60 mol % CO_2 and ethane as the major light hydrocarbon component, said liquid mixture being at a high pressure of at least 500 and up to 2250 psia comprising the steps of:
(a) introducing said liquid mixture at said high pressure into the lower portion of an extraction system,
(b) introducing a liquid water phase containing at least 65 mol % water and lean in CO_2 at said high pressure into the top portion of said extraction system whereby said water phase will flow downwardly and said liquid mixture will flow upwardly in contact with said water phase such that said water phase will extract CO_2 from said liquid mixture,
(c) withdrawing said liquid mixture depleted in CO_2 from the top portion of said extraction system,
(d) withdrawing said water phase rich in CO_2 from the bottom portion of said extraction system,
(e) separating said withdrawn water phase into CO_2 gas and water, and
(f) recycling said separated water to the top portion of said extraction system.

4,547,210

PROCESS FOR PRODUCING A GLASS BODY

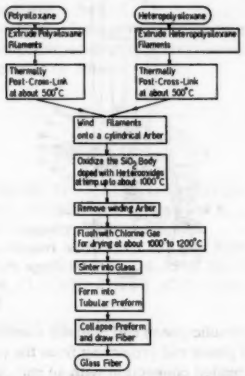
Hartmut Schneider, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 28, 1983, Ser. No. 536,954

Claims priority, application Fed. Rep. of Germany, Sep. 28, 1982, 3235869

Int. Cl.[4] C03B *37/01, 37/02*

U.S. Cl. 65—2 **1 Claim**


Polysiloxane
Heteropolysiloxane
Extrude Polysiloxane Filaments
Extrude Heteropolysiloxane Filaments
Thermally Post-Cross-Link at about 500°C
Thermally Post-Cross-Link at about 500°C
Wind Filaments onto a cylindrical Arbor
Oxidize the SiO2 Body doped with Heterooxides at temp up to about 1000°C
Remove winding Arbor
Flush with Chlorine Gas for drying at about 1000°to 1200°C
Sinter into Glass
Form into Tubular Preform
Collapse Preform and draw Fiber
Glass Fiber

1. A process for producing a glass fiber, comprising:

extruding filaments or tapes of viscous batch of a silicon-organic material selected from the class consisting of polysiloxanes, heteropolysiloxanes and mixtures thereof;

thermally post-cross-linking said filaments or tapes at a temperature in the range of about 500° C. to form cured tapes or filaments;

winding said cured filaments or tapes onto a cylindrical arbor to form a wound body;

heating said wound body in an oxidizing atmosphere at a temperature in the range up to about 1000° C. so as to chemically convert the silicon-organic material of the wound body into an oxide material containing SiO_2 and to convert the wound body into an oxide body;

there removing said arbor from the oxide body to form a tubular oxide body;

flushing said tubular oxide body with a heated gas stream containing chlorine gas so as to remove any traces of water from the body, said gas stream being heated to a temperature in the range of about 1000° to 1200° C.;

then sintering said tubular oxide body at a temperature in the range of about 1200° to 1500° C. so as to convert said tubular oxide body into a tubular glass body; and

collapsing said tubular glass body into a preform and drawing a glass fiber from said preform.

4,547,211

CONTROL OF A GLASSWARE FORMING MACHINE

James W. Ananias, Muncie, Ind., assignor to Ball Corporation, Muncie, Ill.

Continuation of Ser. No. 453,122, Dec. 27, 1982, abandoned, which is a continuation of Ser. No. 283,003, Jul. 13, 1981, abandoned, which is a continuation of Ser. No. 66,297, Aug. 13, 1979, abandoned, which is a continuation of Ser. No. 898,188, Apr. 20, 1978, abandoned. This application Sep. 17, 1984, Ser. No. 652,144

Int. Cl.[4] C03B *9/40*

U.S. Cl. 65—29 **8 Claims**

1. A glassware-forming system, comprising:

at least one glassware-forming machine having a plurality of sections, each section of each machine having a plurality of movable components which are actuatable to operate in a synchronized relationship to form rigid glassware;

a gob feeder for feeding molten glass to each section of the glassware-forming machine;

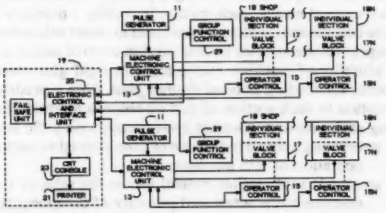
section control means including a plurality of controllers capable of varying the actuating times of movable section components and including stored and variable programs for the operation of identified movable section components;

a system control adapted to permit an operator to vary system operations and including a central processing unit for transferring variable time data from the system control to the plurality of controllers, said system control including a group function control means for automatically controlling the variation of operating times of at least one group of movable section components by the plurality of controllers when the change in operating time of one movable section component in the group necessitates corresponding changes in the operating times of other movable section components in the group, said group function control means including a data bank with the central processing unit; and

a rapidly accessible data storage means capable of storing job history information on the timing and synchronization of the movable components of the sections of the glassware-forming machine.

3. A glassware-forming system, comprising:

at least one glassware-forming machine having a plurality of sections, each section having a plurality of movable components which are actuatable to operate in a synchronized relationship to form rigid glassware.



a gob feeder for feeding molten glass to each section of the glassware-forming machine;

section control means including a plurality of controllers capable of varying the actuating times of the section components and including stored and variable programs for the operation of identified movable section components; and

a system control, comprising:

a central control adapted to permit an operator to vary system operations;

a central processing unit for transferring variable time data between the system control and the section control means;

a rapidly accessible data storage means capable of storing job history information on the timing and synchronization of the movable components of the sections;

a fail-safe unit; and

electronic interface means for isolating the system control from the section control means and for presenting data from the system control to only data-identified controllers;

the electronic interface means including a plurality of modules associated with each controller of the section control means, said modules providing means to address decode, and transmit information from the central processing unit to data-identified controllers of the section control means, and means to block transmission of information between the system control and non-identified controllers upon actuation of the fail-safe unit for preventing an operator from varying component-operating times of the wrong section control means.

5. In a glassware-forming system including at least one glassware-forming machine having a plurality of sections and section control means, each section including a plurality of movable components which are operated in timed relationship with respect to one another by said section control means in each of a plurality of cycles to form rigid glassware, a gob feeder for feeding gobs of molten glass from a predetermined location to each section of said at least one machine, a method of controlling said system, comprising the steps of:

generating a signal indicative of the time elapsed in each cycle of operation of said machine;

storing in said section control means, the relative times in a machine cycle when said plurelity of components in the associated section is to be operated;

controlling in response to the generation of said elapsed time signal and component operating time signals stored in said section control means, the operating times of said movable components of said sections;

varying system operation by selectively entering into said system by means of an operator keyboard means, a series of varied component operating times to change when one or more of said movable components are to be operated in a machine cycle;

communicating said varied component operating times between said keyboard and said section control means to record and to change the timing of said movable components; and

inhibiting said operator keyboard means from communicating with said section control means if said operator attempts to vary component operating times of the wrong section control means.

6. In a glassware-forming system including at least one glassware-forming machine having a plurality of sections and section control means, each section including a plurality of movable components which are operated in timed relationship with respect to one another by said section control means in each of a plurality of machine cycles to form rigid glassware, a gob feeder for feeding gobs of molten glass from a predetermined location to each section of said machine, a method of controlling said glassware-forming system comprising the steps of:

generating a signal indicative of time elapsed in each cycle of operation of said machine;

storing in said section control means the relative times in a machine cycle when said plurality of components in each section is to be operated;

controlling in response to the generation of said elapsed time signal and the component operating times stored in said section control means, the operating time of said movable components of said sections;

automatically varying the operating times of a related group of components of the glassware-forming machine when the change in operating time of one component in said group necessitates corresponding changes in the operating times of the other components of said group;

communicating said varied component operating times through a central processing unit to said section control means of the machine to thereby record the varied timing of said movable varied components in said section control means and to change the timing of said movable components.

4,547,212

TAKE-OUT MECHANISM FOR A GLASSWARE FORMING MACHINE

Hermann H. Nebelung, Zurich, Switzerland, assignor to Emhart Industries, Inc., Farmington, Conn.

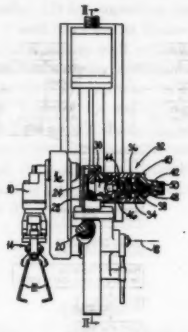
Filed Oct. 29, 1984, Ser. No. 666,029

Claims priority, application United Kingdom, Nov. 11, 1983, 8330185

Int. Cl.[4] C03B *9/44*

U.S. Cl. 65—260 **6 Claims**

1. A take-out mechanism for a glassware forming machine comprising a carrier movable in an arcuate path between a first position at which gripper members supported by the carrier can grip an article of glassware and a second position at which the gripper members can release the article on to a support, an arm on which the carrier is mounted, and moving means operable to turn the arm about a horizontal axis to move the carrier along the arcuate path, the moving means comprising a shaft on which the arm is mounted for rotation about the horizontal axis about which the arm turns, and a hydraulic piston and cylinder assembly operable to turn the arm about the horizontal axis, the hydraulic piston and cylinder assembly comprising a piston, a first piston rod projecting from the piston and making a screw-threaded connection with an end cap of the cylinder which is held against rotation, the screw-threaded connection being such that, when the piston moves along the cylinder, the piston is caused to turn about a horizontal axis of the cylinder, and a second piston rod projecting from the piston and making a connection with the arm such that, when the piston turns in the cylinder, the arm is caused to turn.



4,547,213

ROCK PHOSPHATE/SULFUR FERTILIZER COMPOSITION

Jerry H. Stoller, Bunkerhill, Tex., assignor to Stoller Enterprises, Inc., Houston, Tex.

Filed Mar. 14, 1983, Ser. No. 475,142

Int. Cl.[4] C05B *17/00*; A01N *25/02*

U.S. Cl. 71—53 **13 Claims**

1. A fertilizer composition comprising an intimate mixture of fine particles of ground rock phosphate containing phosphorus in a substantially water insoluble form and having a particle size in the range of 1 to 100 microns and sulfur having a particle size in the range of 1 to 5 microns, said rock phosphate, calculated on the basis of P_2O_5, and sulfur being present in the weight ratio of P_2O_5:S in the range of 1:0.5 to 1:2.0.

4,547,214

PESTICIDALLY ACTIVE AZOLYL-HYDROXY ALKANONES

Patrick J. Crowley, Crowthorne, and John C. Williams, Bracknell, both of England, assignors to Imperial Chemical Industries PLC, Hertfordshire, England

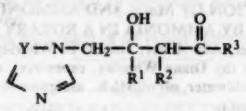
Filed Dec. 21, 1982, Ser. No. 451,762

Claims priority, application United Kingdom, Feb. 2, 1982, 8202976

Int. Cl.[4] A01N *43/50, 43/64*; C07D *233/60, 249/08*

U.S. Cl. 71—76 **5 Claims**

1. An azole compound selected from the group consisting of compounds having the formula (I):



(I)

wherein Y is =N—; R^1 is 4-chlorophenyl or 2,4-dichlorophenyl; R^2 is methyl or ethyl and R^3 is alkyl having from 1 to 4 carbon atoms; and acid addition salts, metal complexes, lower alkanoate, lower alkyl or benzyl derivatives of the hydroxy group and stereoisomers thereof.

3. A fungicidal, or plant growth regulating composition comprising an effective amount of a compound as claimed in claim 1, and a carrier or diluent.

4,547,215

HERBICIDAL SULFONAMIDES

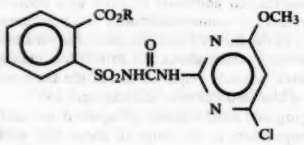
Anthony D. Wolf, Elkton, Md., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 392,364, Mar. 24, 1983, abandoned. This application Sep. 6, 1983, Ser. No. 528,607

Int. Cl.⁴ C07D *239/69;* A01N *47/36*

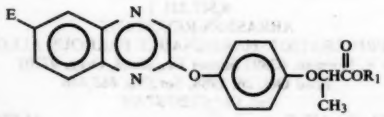
U.S. Cl. 71—92 **18 Claims**

1. A compound of the formula:



wherein R is C_2H_5 or $CH(CH_3)_2$; and their agriculturally suitable salts.

4. A mixture of an herbicidally effective amount of a compound of claim 1 with an herbicidally effective amount of a compound of the formula:



wherein

E is H, Cl, Br, F or CF_3; and

R_1 is C_1–C_4 alkyl or $CH_2CH_2OCH_2CH_2OCH_2CH_3$.

4,547,216

3,4-DI-(METHYLAMINO)-6-TERT.-BUTYL-4,5-DIHYDRO-1,2,4-TRIAZIN-5-ONE, ITS USE AS HERBICIDE AND A PROCESS FOR ITS PRODUCTION

Beat Böhner, Binningen, Switzerland, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Jan. 6, 1984, Ser. No. 568,869

Claims priority, application Switzerland, Jan. 12, 1983, 150/83

Int. Cl.⁴ A01N *43/64;* C07D *253/06*

U.S. Cl. 71—93 **18 Claims**

1. 3,4-Di-(methylamino)-6-tert-butyl-4,5-dihydro-1,2,4-triazin-5-one.

4,547,217

THIOPHENE OR FURAN HERBICIDES

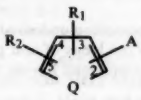
Rafael Shapiro, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 345,935, Feb. 8, 1982, Pat. No. 4,441,910, which is a continuation-in-part of Ser. No. 247,134, Mar. 24, 1981, abandoned. This application Jan. 27, 1984, Ser. No. 574,711

Int. Cl.⁴ A01N *43/66;* C07D *251/16, 405/12, 409/12*

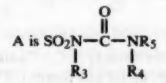
U.S. Cl. 71—93 **39 Claims**

1. A compound of the formula:



wherein

Q is O or S;



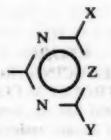
R_1 is $R_6S[O]_n$;

R_6 is C_1–C_4 alkyl, C_3–C_4 alkenyl, cyclopentyl or cyclopropylmethyl;

R_2 is H, Cl, Br or CH_3;

R_3 and R_4 are independently H or CH_3; n is 0, 1 or 2; and

R_5 is



wherein

X is CH_3 or OCH_3;

Y is H, Cl, CH_3, C_2H_5, OCH_3, OC_2H_5 or CH_2OCH_3;

Z is N;

and their agriculturally suitable salts; provided that:

both R_3 and R_4 may not simultaneously be CH_3, and further provided that R_1 and A are bonded to adjacent carbon atoms of the thiophene or furan ring.

29. A composition suitable for controlling the growth of undesired vegetation which comprises an effective amount of a compound of claim 1 and at least one of the following: surfactant, solid or liquid diluent.

4,547,218

CERTAIN 3-NITRO-6-PHENOXY-2-PYRIDYL-OXY-PROPIONATES HAVING HERBICIDAL ACTIVITY

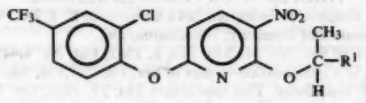
Sudarshan K. Malhotra, Walnut Creek, and B. Clifford Gerwick, III, Concord, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 434,994, Oct. 18, 1982, abandoned. This application Oct. 7, 1983, Ser. No. 539,909

Int. Cl.⁴ C07D *213/64;* A01N *43/40*

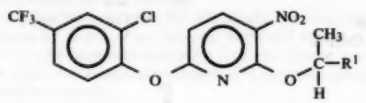
U.S. Cl. 71—94 **6 Claims**

1. A compound having the formula



wherein R^1 is a carboxyl moiety, a C_1–C_6 alkyl ester thereof, an alkali or alkaline earth metal salt thereof, a C_1–C_6 alkyl substituted or unsubstituted ammonium salt thereof, or a benzyl or C_3–C_6 alkoxyalkyl ester thereof and their optically active isomers.

5. The method of controlling undesired plant growth which comprises applying to the locus of said plants a herbicidally-effective amount of a compound having the formula



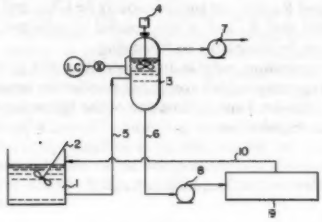
wherein R^1 is a carboxyl moiety, a C_1–C_6 alkyl ester thereof, an alkali or alkaline earth metal salt thereof, a C_1–C_6 alkyl substituted or unsubstituted ammonium salt thereof, or a benzyl or C_3–C_6 alkoxyalkyl ester thereof and their optically active isomers.

4,547,219

METHOD OF REDUCING IRON ORE USING PETROLEUM COKE

Toshio Matsuoka; Shinichi Kurozu, both of Niihama, and Seiji Sugimori, Saijo, all of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo, Japan

Division of Ser. No. 509,725, Jun. 30, 1983, abandoned. This application Aug. 31, 1984, Ser. No. 646,482
Claims priority, application Japan, Jul. 2, 1982, 57-113860
Int. Cl.⁴ C21B *13/00*
U.S. Cl. 75—29 **3 Claims**



1. In a method of reducing iron ore wherein the iron ore is directly reduced in the presence of a solid reducing agent, by carbon monoxide gas which is produced from the solid reducing agent in the presence of CO_2 by the reaction $C+CO_2 \rightarrow 2CO$, the improvement which comprises providing, as the source of the carbon monoxide gas a solid reducing agent, which is an activated petroleum coke produced by impregnating petroleum coke under reduced pressure with an aqueous solution or suspension of an alkaline earth metal compound to contain 0.2% or more by weight of the alkaline earth metal compound in the coke.

4,547,220

REDUCTION OF MoO_3 AND AMMONIUM MOLYBDATES BY AMMONIA IN A ROTARY FURNACE

Kent H. Carpenter, Ann Arbor; Gerald E. Whorley, deceased, late of Bronson (by Diana Whorley, executrix), and Thomas W. Lennard, Coldwater, all of Mich., assignors to Amax Inc., Greenwich, Conn.

Filed Apr. 24, 1984, Ser. No. 603,392
Int. Cl.⁴ C22B *34/34*
U.S. Cl. 75—84 **11 Claims**

1. A method for the intermediate reduction of a molybdenum compound selected from the group consisting of MoO_3 and ammonium molybdate to MoO_2 which comprises:

feeding said molybdenum compound to the feed end of an indirect fired longitudinally shaped rotary calciner with said feed end slightly elevated relative to its discharge end such that the said compound flows during reduction to said discharge end,

said rotary calciner having lifters therein spaced about its inner periphery and extending along the length of the calciner and projecting radially towards the axis of rotation of said calciner to effect continuous mixing of said compound during the reduction thereof,

causing uncracked ammonia to flow as a reductant either concurrently or countercurrently at a predetermined rate relative to the flow of said compound at an amount calculated to range from about 5% to 100% excess of the stoichiometric amount required to reduce the compound to MoO_2 while said calciner is rotating,

and bringing said molybdenum compound and said ammonia to a temperature in the range of about 300° C. to 700° C. at which a significant rate of reaction obtains,

said reaction rate at said temperature range together with the rotation rate of said calciner being such as to provide a sufficient residence time in said calciner to convert the molybdenum compound to MoO_2 at a conversion efficiency of at least about 80%.

4,547,221

ABRASION-RESISTANT REFRIGERATION-HARDENABLE FERROUS ALLOY

Telfer E. Norman, 63893 Sunset Dr., Bend, Oreg. 97701

Filed Oct. 26, 1984, Ser. No. 665,446
Int. Cl.⁴ C22C *37/08*
U.S. Cl. 75—128 C **11 Claims**

1. An abrasion-resistant refrigeration-hardenable ferrous alloy consisting essentially of about 2.6% to about 3.6% carbon, about 12% to about 22% chromium, about 0.5% to about 1.1% manganese, about 1.0% to about 3.0% molybdenum, about 0.5% to about 1.5% copper, about 1.4% to about 2.5% nickel, about 1.4% to about 2.5% silicon and the balance iron together with incidental impurities and normal residual elements present in the usual amounts.

4,547,222

HIGH PRINT INTENSITY MARKING FLUID

Nicola Marinelli, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed May 21, 1984, Ser. No. 612,487
Int. Cl.⁴ C09D *11/00*; G01D *15/06*
U.S. Cl. 106—21 **4 Claims**

1. A marking liquid composition for yielding an apparent blue-colored mark of high print intensity comprising an organic solvent solution of

about 3% by weight of crystal violet lactone,

about 64% by weight of petroleum alkylate dodecyl benzene, and
about 33% by weight of alkylated biphenyl.

4,547,223
CEMENT-SHRINKAGE-REDUCING AGENT AND CEMENT COMPOSITION

Takaharu Goto, Ichikawa; Takeshi Sato, Narashino; Kouzou Sakai, Kyoto, and Motohiko Ii, Uji, all of Japan, assignors to Nihon Cement Co., Ltd., Kyoto, Japan

PCT No. PCT/JP81/00042, § 371 Date May 4, 1982, § 102(e) Date May 4, 1982, PCT Pub. No. WO82/03071, PCT Pub. Date Sep. 16, 1982
PCT Filed Mar. 2, 1981, Ser. No. 377,200
Int. Cl.⁴ C04B *7/35*
U.S. Cl. 106—90 **6 Claims**

1. A cement composition containing cement and at least one compound selected from the group of compounds of the formulas

$$RO(C_2H_4O)_{1\text{-}5}H \quad (2)$$

$$RO(C_3H_6O)_1H \quad (3)$$

$$RO(A_1O)_{2\text{-}10}H \quad (4)$$

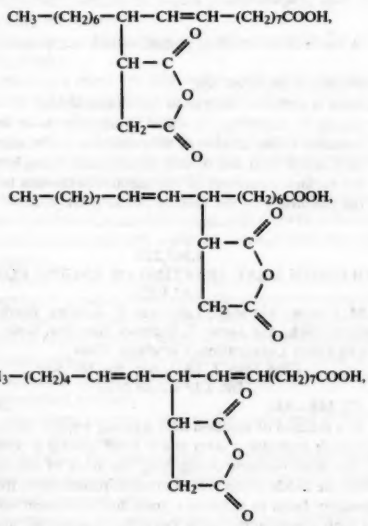
in which R represents a $C_{1\text{-}5}$ alkyl or $C_{5\text{-}6}$ cycloalkyl radical, and $—A_1O—_{2\text{-}10}$ is a polyoxyalkylene radical of 2–10 moles consisting of C_2H_4O and C_3H_6O.

4,547,224
EMULSIFIERS FOR BITUMINOUS EMULSIONS

Peter Schilling, Charleston, S.C., assignor to Westvaco Corporation, New York, N.Y.

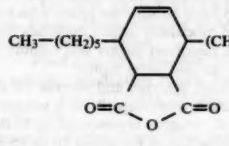
Filed Sep. 17, 1984, Ser. No. 651,467
Int. Cl.⁴ C08L *95/00*
U.S. Cl. 106—273 **20 Claims**

1. A bituminous emulsion comprising from about 30% to about 80% by weight of bitumen, from about 0.1% to about 10% by weight of an emulsifier selected from the group consisting of reaction products of polyamines reacted with a polycarboxylic acid anhydride of the following formulae:



and

-continued



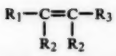
and water to make up 100% by weight, the emulsion having a pH in the range of from 2–7.

4,547,225
ADDITIVES FOR HOT MIX ASPHALT

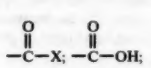
Anthony V. Grossi; Louis T. Hahn, and Alfred Marzocchi, all of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 7, 1984, Ser. No. 607,858
Int. Cl.⁴ C08L *95/00*; C09D *3/24*
U.S. Cl. 106—273 N **8 Claims**

1. A method of increasing the bonding energy between an asphalt and an aggregate which comprises incorporating into the asphalt a chemically-modified asphalt composition obtained by heating a mixture consisting of a vinyl monomer having the general formula



wherein R_1 is an aromatic group containing 6 to 12 carbon atoms, R_2 is hydrogen or lower alkyl group and R_3 is hydrogen or a lower alkyl or a group selected from the group consisting of $—CH_2OH$; —CHO;



and $—CH_2—CN$ wherein X is a halogen; an acrylamide and an asphalt at a temperature of at least 110° C. for at least about 8 hours, wherein said chemically modified asphalt comprises from about 1 to about 10 weight percent based on the total weight of said asphalt and said chemically-modified asphalt.

4,547,226
PREPARATION OF HIGH FRUCTOSE SYRUPS FROM CITRUS RESIDUES

Robert A. Milch, Baltimore; Patricia Guerry-Kopecko, Rockville; Carol Koeble-Smith, Andrews Air Force Base, and Edward M. Sybert, Ellicott City, all of Md., assignors to IGI Biotechnology, Inc., Columbia, Md.

PCT No. PCT/US83/01192, § 371 Date Aug. 3, 1983, § 102(e) Date Aug. 3, 1983, PCT Pub. No. WO84/00561, PCT Pub. Date Feb. 16, 1984
Continuation-in-part of Ser. No. 405,037, Aug. 4, 1982, Pat. No. 4,488,912. This PCT application Aug. 3, 1983, Ser. No. 531,338
Int. Cl.⁴ C13K *1/00*; C13D *1/00*; C11B *9/02*; C12P *19/02*
U.S. Cl. 127—41 **12 Claims**

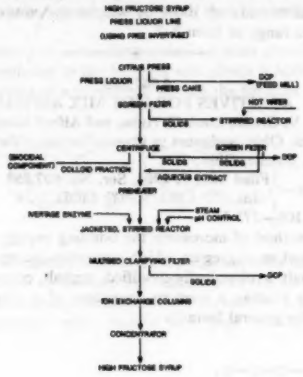
1. A process for recovering a plurality of useful products from a citrus press liquor line from which a citrus press cake and screenable solids have been removed, which process comprises:

(A) ultrafiltering the screen filtered press liquor to form (i) a permeate fraction consisting essentially of limonene-containing biocidally active materials and an aqueous solution of the dissolved sugars and soluble polymeric carbohydrates from said press liquor, and (ii) a retentate fraction

consisting essentially of solid citrus fragments and shards from said press liquor;

(B) recovering the biocidally active materials from the permeate fraction to form an aqueous phase which is substantially free of said biocidally active materials and consists essentially of the dissolved sugars and soluble polymeric carbohydrates from said press liquor;

(C) extracting fructose, glucose, and sucrose by suspending the retentate fraction from step (A) in a volume of water at 65–85 degrees C. roughly corresponding to the original volume of said press liquor for about 10 to 15 minutes;



(D) separating the residual water-insoluble material remaining after the aqueous extraction of step (C) and combining it with a press cake from which citrus press liquor has been separated to increase the solids content thereof by at least 10 percent on a dry weight basis; and

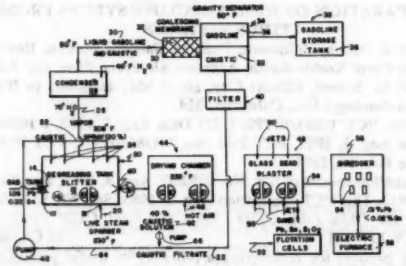
(E) combining the separated aqueous extract from step (C) with the aqueous phase from step (B) to increase the hexose content of said aqueous phase by at least 20 percent by volume.

4,547,227

METHOD FOR PREPARING A STEEL CHARGE FROM TERNEPLATE SCRAP METAL

Carl J. Herter, 1638 Walnut St., Allentown, Pa. 18102

Filed Apr. 9, 1984, Ser. No. 598,445
Int. Cl.[4] B08B *7/04*
U.S. Cl. 134—7 **17 Claims**



1. A method of preparing a low residual alloy material for steel charge from terneplate scrap metal contaminated with combustibles comprising:

(a) introducing said contaminated terneplate scrap metal feed into a feed end of a degreaser, maintaining said degreaser at about 200 degrees F. by introducing live steam therein, down sizing said metal scrap with a cutting means in said degreaser, emulsifying said residual combustibles including volatile hydrocarbons from said metal feed by contacting said metal feed with a vaporized caustic spray combined with said live steam in said degreaser to thereby cleanse said feed;

(b) separating said metal feed from said emulsion;

(c) drying said metal feed; and,

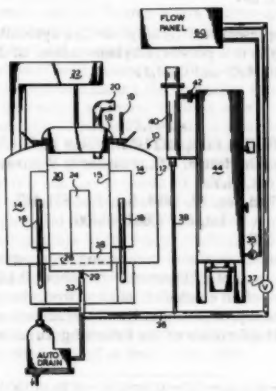
(d) introducing said dried feed into a blast chamber wherein said dried feed is contacted with jets of glass beads to remove lead and tin from said feed and thereby produce a sand of glass, lead and tin and further leaving said scrap metal feed with a lead and tin content sufficiently low to be suitable for use as a charge in a steel making furnace.

4,547,228

SURFACE TREATMENT OF METALS

Carol A. Girrell, North Brunswick, and Joseph E. Japka, Cherry Hill, both of N.J., assignors to Procedyne Corp., New Brunswick, N.J.

Filed May 26, 1983, Ser. No. 498,327
Int. Cl.[4] C23C *11/00*
U.S. Cl. 148—16 **10 Claims**



1. A method for treating metals, which comprises the steps of:

providing a fluidized bed;

placing a metal workpiece in the fluidized bed;

sequentially exposing the metal workpiece to at least two separate metal treatment atmospheres in the same fluidized bed at least one of said atmospheres being humidified for surface treatment of the metal workpieces to modify the chemistry of the surface of the workpiece.

4,547,229

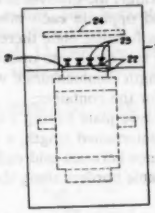
SOLUTION HEAT TREATING OF ENGINE POPPET VALVES

Jay M. Larson, Marshall; Lawrence F. Jenkins, Battle Creek, both of Mich., and James E. Belmore, Kearney, Nebr., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 7, 1984, Ser. No. 607,530
Int. Cl.[4] C21D *1/26*
U.S. Cl. 148—134 **10 Claims**

1. In a method of solution heat treating poppet valves of the type which includes a stem and a head having a combustion face, the improvement comprising the steps of solution heat treating the heads of the valves to a controlled depth from their combustion faces to achieve a grain size consistent with optimum high temperature valve operating conditions, and maintaining the valve stems at a temperature lower than that of the

heads, whereby the resulting microstructure is characterized by a coarse grain size in the head becoming progressively finer



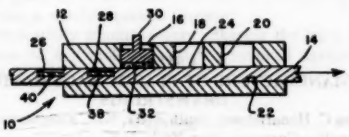
through a specific transition zone to a fine grain size in the stem consistent with good low temperature properties.

4,547,230

LPE SEMICONDUCTOR MATERIAL TRANSFER METHOD

Frank Z. Hawrylo, Trenton, N.J., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 30, 1984, Ser. No. 635,393
Int. Cl.⁴ H01L *21/208*
U.S. Cl. 148—171 **4 Claims**



1. A method of transferring semiconductor material to form predetermined patterns by liquid phase epitaxy, said method comprising the steps of:

(1) preparing a top surface of a growth wafer for photolithography;

(2) placing a mask on said wafer, said mask having areas removed whereby said top surface of said growth wafer has selected exposed areas;

(3) preparing a liquid growth solution in a well of furnace boat, said growth solution having elemental constituents the same as said growth wafer;

(4) heating said growth solution for a period of time so that an equilibrium is established in said growth solution;

(5) placing said growth wafer in contact with said growth solution;

(6) raising the temperature of said growth solution a predetermined amount based upon the amount of semiconductor material to be transferred and the length of time exposed to said growth wafer at an elevated temperature;

(7) removing said growth wafer from said growth solution;

(8) lowering the temperature of said growth solution in a controlled manner;

(9) selectively placing a seed wafer under said growth solution at about equilibrium;

(10) lowering the temperature a predetermined amount so that non-equilibrium conditions cause epitaxial deposition of said material; and

(11) removing said seed wafer from said growth solution after epitaxial deposition of said patterns.

4,547,231

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICE UTILIZING SELECTIVE EPITAXIAL GROWTH UNDER REDUCED PRESSURE

Shiro Hine, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 26, 1984, Ser. No. 625,783
Claims priority, application Japan, Jul. 8, 1983, 58-125237
Int. Cl.⁴ H01L *21/205, 21/76*
U.S. Cl. 148—175 **4 Claims**

1. A method of manufacturing a semiconductor device including a plurality of semiconductor elements separated from each other by an insulating film, said method comprising the steps of:

forming an insulating film on a substrate;

selectively defining removed portions with respect to said insulating film, said removed portions comprising first portions in which semiconductor elements are to be provided and second portions in which no semiconductor element is to be provided, said portions being arranged substantially uniformly along said substrate; and

locating said second portions circumferentially outwardly of said first portions; and

growing semiconductor layers in said removed portions by selective epitaxial growth under reduced pressure,

selecting only elements formed in said first portions for use as semiconductors in a circuit.

4,547,232

SENSITIZATION OF WATER-IN-OIL EMULSION EXPLOSIVES

Richard V. Cartwright, Wantage Township, Sussex County, N.J., assignor to Hercules Incorporated, Wilmington, Del.

Filed Sep. 24, 1984, Ser. No. 653,995
Int. Cl.⁴ C06B *45/00*
U.S. Cl. 149—2 **16 Claims**

1. A high density emulsion blasting composition comprising

(A) an invert water-in-oil emulsion having a continuous hydrophobic organic phase comprising an emulsifier, a hydrocarbon or carbonaceous fuel component, and a discontinuous aqueous phase comprising at least one soluble inorganic oxidizer salt;

(B) an effective amount of a sensitizing formulation comprising

(a) about 4–80% by weight of formulation of a polynitrate ester of a 2–5 carbon polyhydric alcohol,

(b) about 0.5%–8% by weight of nitrocellulose,

(c) about 10–60% by weight of ammonium nitrate,

(d) up to 20% by weight of particulate carbonaceous solids,

(e) up to 45% by weight of sodium chloride,

(f) up to 74% by weight of sodium nitrate; and

(C) up to about 20% by composition volume of a density control agent.

4,547,233

GAS-FILLED GLASS BEADS AND METHOD OF MAKING

Marcel Delzant, Charleroi, Belgium, assignor to Glaverbel, Brussels, Belgium

Filed May 9, 1984, Ser. No. 610,089
Claims priority, application United Kingdom, May 13, 1983, 8313291
Int. Cl.⁴ C06B *45/00*; C03B *19/10*
U.S. Cl. 149—2 **15 Claims**

1. A method of producing gas-filled hollow glass beads comprising the steps of manufacturing hollow glass beads having an alkali content of at least 20% calculated as weight % of oxide in the bead, contacting the beads with an acidic treatment medium to reduce the alkali content of the beads to not more than 15%, and causing nonhydrogen gas to diffuse into

the beads after manufacture thereof by exposing said beads to said gas at a pressure greater than one atmosphere.

4,547,234

EXPLOSIVE COMPOSITION

Fumio Takeuchi; Masao Takahashi, and Hiroshi Sakai, all of Aichi, Japan, assignors to Nippon Oil and Fats Company Limited, Tokyo, Japan

Filed Jul. 5, 1984, Ser. No. 627,781
Claims priority, application Japan, Jul. 15, 1983, 58-127557
Int. Cl.[4] C06B *45/18*
U.S. Cl. 149—3 **11 Claims**

1. In an explosive composition containing micro-voids, the improvement comprising the micro-voids being formed of thermoplastic resin hollow microspheres coated with a thermosetting resin.

4,547,235

GAS GENERANT FOR AIR BAG INFLATORS

Fred E. Schneiter, North Ogden, and Allan J. McDonald, Pleasant View, both of Utah, assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Jun. 14, 1984, Ser. No. 620,653
Int. Cl.[4] C06B *35/00*
U.S. Cl. 149—35 **11 Claims**

1. A gas generant composition for generating an airbag inflating gas upon combustion comprising:

a. about 60% to about 68% sodium azide, b. about 18% to about 24% silicon dioxide c. about 8% to about 20% potassium nitrate d. about 2% to about 20% molybdenum disulfide e. about 2% to about 4% sulfur,

wherein said silicon dioxide and said potassium nitrate are provided in a gas generant burn rate controlling ratio of silicon dioxide to potassium nitrate of from 1:1 to 2:1,

wherein said silicon dioxide and said potassium nitrate provide for the reduction of potentially caustic materials in said gas, the silicon dioxide reacting with the potassium from said potassium nitrate and sodium from said sodium azide generated upon combustion to form silicates in the form of an innocuous klinker; and

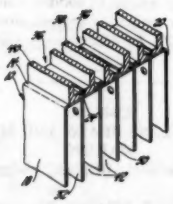
wherein all percentages are by weight based on total composition weight.

4,547,236

EXTRUDED COMPARTMENTALIZED CONTAINER

Charles P. McCartney, Jr., Yorktown, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 7, 1982, Ser. No. 385,495
Int. Cl.[4] B29C *27/00, 19/00;* B65B *7/00;* B32B *31/16*
U.S. Cl. 156—69 **3 Claims**



1. A method of making a container having a plurality of compartments comprising the steps of:

extruding a thermoplastic material into a substantially continuous length of tubular stock including first and second pairs of opposing walls defining a parallelepipedial central cavity;

channel-like external ridges rooted on, and projecting outwardly of, each of said first pair of cavity-defining walls, said ridges extending the length of said stock parallel to said second pair of walls and each ridge comprising two opposed sidewalls adjoining an end wall outboard the cavity-defining wall for defining an internal groove coextensive with said ridge, the grooves in said opposing walls being parallel and opposite each other and adapted to receive a partition-forming plate therein;

transversely cutting said stock into open-ended segments of predetermined length commensurate with the volumetric capacity sought for the container;

forming a thermoplastic plate having a length substantially equal to said predetermined length, a width substantially equal to the distance between said end walls of opposing grooves, and sealable borders along the lengthwise edges of said plate;

inserting said borders into opposing grooves such that said plate lies transverse said cavity parallel to said second pair of walls and divides said cavity into adjacent compartments;

welding said borders to the inside of said ridges so as to permanently secure said plate to said first pair of walls and provide a liquid-tight seal between said adjacent compartments; and

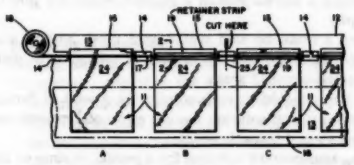
securing a cover to at least one of said open ends in liquid-tight relation to said plate and said first and second pairs of walls.

4,547,237

MANUFACTURE OF PLASTIC BAGS HAVING DRAWSTRINGS

Thomas C. Hendrickson, South River, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 827,673, Aug. 25, 1977, abandoned.
This application Sep. 7, 1979, Ser. No. 73,286
Int. Cl.[4] B31B *1/90*
U.S. Cl. 156—70 **5 Claims**

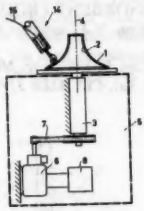


1. A method of providing drawstrings on synthetic plastic bags comprising the steps of applying the leading end of a continuous length of flexible drawstring material to overlie the side surfaces of all of a plurality of spaced relatively limp empty closed plastic bags retained upon and lying flat on a surface adjacent the open ends of said bags, applying individual drawstring retainer tapes to overlie at least the major portion of the section of said drawstring length that is coextensive with the width of each bag, fixing each said tape to its respective bag while only freely laterally enclosing the associated section of drawstring length so that the drawstring length remains longitudinally movable with respect to said bags, and then severing said drawstring length intermediate each pair of adjacent bags whereby each bag operatively mounts a retained individual drawstring that extends therefrom at both ends of the retainer tape thereon.

4,547,238
METHOD OF MANUFACTURING A SADDLE-SHAPED COIL

Wilhelmus L. L. Lenders, Son, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 13, 1984, Ser. No. 579,245
Claims priority, application Netherlands, Feb. 14, 1983, 8300544
Int. Cl.[4] B21F *3/00, 45/00;* H01F *27/30*
U.S. Cl. 156—73.2 9 Claims



1. A method for manufacturing a unitary assembly for deflecting an electron beam, such assembly comprising a saddle-shaped coil of wire adhered to the surface of a non-magnetic molding, the surface of such molding being concave in the direction of said beam and convex in a direction transverse to the beam direction, such method comprising:

continuously supplying wire from a winding station;

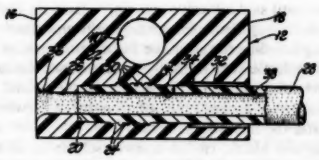
continuously positioning the wire as it is supplied against the surface of said molding by means of a grooved movable wire guide so as to form a number of contiguous turns defining a window pattern thereon;

and substantially simultaneously adhering the wire to the surface of said molding as it is positioned against such surface.

4,547,239
METHOD FOR ATTACHING A FITTING TO A CONDUIT OF A PUSH-PULL CONTROL

John A. Carlson, Conroe, Tex., assignor to Teleflex Incorporated, Limerick, Pa.

Filed Jul. 16, 1984, Ser. No. 630,953
Int. Cl.[4] B29C *27/08*
U.S. Cl. 156—73.5 7 Claims

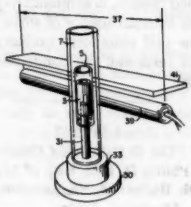


1. A method for assembling a motion-transmitting remote control assembly of the type having a fitting (12) with a bore (14) extending therethrough with a shoulder (20) separating a large diameter portion (22) having a helical groove (24) therein from a small diameter portion (26) and a conduit (28) attached to the fitting (12) within the large diameter portion (24) of the bore (14) up to the shoulder (20), said method comprising the steps of: establishing relative rotation between the fitting (12) and the conduit (28) about the axis of the bore (14) and establishing relative longitudinal movement between the conduit (28) and the fitting (12) to move the said conduit (28) into the bore (14) to engage the bore (14) and soften the material of the conduit (28) by friction to fill the groove (24) and terminating the relative rotation with the end of the conduit (28) engaging the shoulder (20).

4,547,240
METHOD OF PREFABRICATING AN ELECTRICAL CONNECTOR

James A. Zilligen, 203 Holly Park Dr., Simpsonville, S.C. 29681, and Richard J. Feeny, 81 Winfield Rd., Greenville, S.C. 29607

Filed Jun. 9, 1983, Ser. No. 502,615
Int. Cl.[4] B29C *27/20*
U.S. Cl. 156—85 4 Claims



1. A process for prefabricating an electrical connector, comprising the steps of:

placing a crimpable ferrule having an insulation sleeve thereon upon a first support in a vertical orientation with respect to the longitudinal axis of said ferrule and said insulation sleeve;

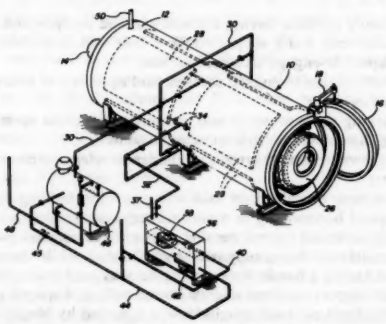
placing an outer sleeve coaxially about said ferrule and insulation sleeve upon a second support, said second support being at a lower elevation than said first support, said outer sleeve formed of a coextruded, multilayer material with at least one layer thereof being oriented and heat-shrinkable, and with the inner layer thereof being a heat-activable adhesive;

passing said first and second supports horizontally through a heating zone to shrink only a portion of said outer sleeve into adhesion with said insulation sleeve.

4,547,241
METHOD AND APPARATUS FOR HEATING PRESSURE VESSEL USED IN TIRE RETREADING SYSTEM

Joe I. Massey, 2740 Village Terr., Springfield, Mo. 65807

Filed Jul. 18, 1983, Ser. No. 514,879
Int. Cl.[4] B29H *5/04*
U.S. Cl. 156—96 2 Claims



1. The method of retreading tires in a pressure vessel for receiving a load of tires to be retreaded consisting of the steps

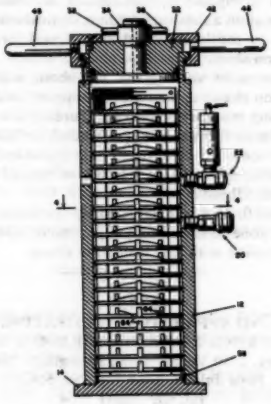
of introducing a plurality of tires to be retreaded into the interior of the vessel, closing the vessel, pressurizing the vessel, providing an isolated flow path for heat exchange media peripherally of the vessel in heat exchange relation to the interior of the vessel for heating the interior thereof to a temperature capable of retreading the tires and, eliminating deterioration of the interior of the vessel and the tires due to direct contact with heat exchange medium, said step of providing a flow path for heat exchange media including the step of positioning a coil plate heat exchanger along the interior surface of the vessel and extending the coil plate heat exchanger over a maximum portion of the length and interior periphery of the vessel to rapidly and evenly heat all of the interior of the vessel and the tires to be retreaded therein, communicating the coil plate heat exchanger with an external source of steam to provide flow of steam through the coil plate heat exchanger as the heat exchange media and returning the condensate to the source of steam for reheating.

4,547,242

AUTOCLAVE FOR BONDING COMPOSITE LENSES

Joseph Tusinski; Phillip D. Hill, both of Muskogee, Okla., and John M. Griffith, Richmond, Va., assignors to Coburn Optical Industries, Inc., Muskogee, Okla.

Filed May 11, 1983, Ser. No. 493,546
Int. Cl.[4] B32B *17/10, 31/20;* B29C *17/04;* B01J *3/04*
U.S. Cl. 156—105 **9 Claims**



1. A small autoclave for bonding composite lenses comprising:

a pressure cylinder having a closed end and an open end, said closed end being supported by a base and said open end adapted to engage a closure means;

a closure means to engage and seal said open end of said pressure cylinder;

a charging valve means in said pressure cylinder for pressurizing the autoclave from an external source;

a safety valve in said pressure cylinder to release excess pressure;

a lens tray contained in said autoclave for holding lenses aligned horizontally in a vertical array comprising a vertically oriented pair of parallel rods one end of said pair of parallel rods being supported by a flat disk while the other end having a handle for carrying the tray, and a plurality of lens support members aligned horizontally and spaced vertically from each other individually mounted by hinges onto one of said parallel rods, said hinges enabling individual motion of each of said lens support members in the horizontal plane for stacking a lens thereon, said lens support members having engaging means opposite of said hinges to engage the other of said parallel rods.

4,547,243

METHOD AND APPARATUS FOR CONTINUOUSLY ATTACHING ELASTIC STRANDS TO DISPOSABLE ABSORBENT PRODUCTS

David L. Brody, Edison, N.J., assignor to Whitestone Products, Piscataway, N.J.

Filed Oct. 9, 1984, Ser. No. 658,836
Int. Cl.[4] B32B *31/06*
U.S. Cl. 156—164 **7 Claims**

1. A method for continuously attaching selected lengths of elastic ribbon to isolated portions of a moving, substantially inelastic web, of inter-connected articles to impart an elasticized character to pre-determined isolated portions of said articles, while preserving the substantially inelastic character of said articles and area where said ribbon is unattached to said web, said method comprising the steps of:

feeding an elastic ribbon to an assembly station in a stretched condition,

continuously applying an adhesive to said stretched elastic ribbon along the length of said ribbon while said stretched elastic ribbon is being fed to said assembly station,

feeding a web of inter-connected articles made with webs of substantially inelastic material to said assembly station,

reducing the quantity of adhesive applied to said stretched elastic ribbon between selected areas of said ribbon,

adhering the stretched elastic strand to said inelastic material in said pre-determined areas,

maintaining said elastic ribbon in a stretched condition at least until said adhesive sets up,

the contracting force of elastic in the pre-determined area being less than the adhesive force between said elastic and said inelastic web in said pre-determined areas while the contracting force of the elastic between said pre-determined areas exceeds the adhesive force between the elastic and the inelastic material,

cutting said elastic ribbon transversely in an area which is between said pre-determined areas thereby permitting contractible force in the elastic between said pre-determined areas to overcome the adhesive bond adjacent thereto and releasing said elastic between the pre-determined areas from the inelastic material and forming severed unadhered ends of elastic at both ends of each length of the stretched elastic ribbon which is adhered to said web in said pre-determined area, and

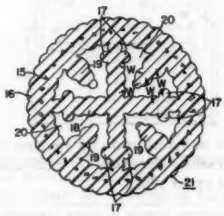
allowing the severed unadhered ends of elastic ribbon to relax and contract to the unstretched state, whereby said unadhered ends to not impart an elasticized character to said web, nor do they interfere with the functioning of the elasticized portion of the web to which the selected lengths of elastic ribbon are adhered in the pre-determined areas.

4,547,244

METHOD FOR PRODUCING CAPILLARY NIBS FOR INSCRIBING INSTRUMENTS

Akio Ito, Inazawa, and Masao Ito, Nagoya, both of Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 171,538, Jul. 23, 1980, Pat. No. 4,410,384, which is a division of Ser. No. 87,304, Oct. 22, 1979, Pat. No. 4,310,259, which is a continuation-in-part of Ser. No. 723,133, Sep. 14, 1976, abandoned, which is a continuation-in-part of Ser. No. 523,876, Nov. 14, 1974, abandoned. This application May 3, 1983, Ser. No. 491,854
Claims priority, application Japan, Nov. 19, 1973, 48-129881
The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.
Int. Cl.[4] D04H *3/16*; B43K *1/06*
U.S. Cl. 156—167 **7 Claims**



1. A method of producing a bar-like capillary nib for use in an inscribing instrument, said method comprising the steps of:
extruding molten, thermoplastic material through a plurality of orifices in an extrusion die and thereby forming a plurality of filaments of said thermoplastic material;
adhering said filaments longitudinally to each other before their surfaces are completely solidified to form a plurality of regularly spaced fluid channels of capillary dimensions extending longitudinally between said filaments; and
providing said orifices of at least two different diameters and arranging said orifices such that said filaments, upon being extruded and adhered together, are of at least two different diameters and are positioned relative to each other to form each said fluid channel to extend continuously throughout the length of the nib and to have a substantially constant width across its transverse cross-sectional area, thereby producing a nib bar having substantially constant capillarity at any cross-sectional position in each said fluid channel.

2. A method of producing a bar-like capillary nib for use in an inscribing instrument, said method comprising the steps of:
extruding a molten thermoplastic material through a plurality of orifices in an extrusion die and thereby forming a plurality of filaments of said thermoplastic material;
adhering said filaments longitudinally to each other before their surfaces are completely solidified to form a plurality of regularly spaced fluid channels of capillary dimensions extending longitudinally between said filaments; and
providing said orifices of at least two different diameter and arranging said orifices such that said filaments which surround and define each said fluid channel, upon being extruded and adhered together, are positioned relative to each other in such a manner that some of said filaments, which, if they were of the same diameter as the other of said filaments, would define transverse widths of the respective said fluid channel larger or smaller than the transverse widths defined by said other filaments, are respectively larger or smaller in diameter than said other filaments, thereby to form each said fluid channel to extend continuously throughout the length of the nib and to have a substantially constant width across its transverse crosssectional area, thereby producing a nib bar having substantially constant capillarity at any cross-sectional position in each said fluid channel.

6. A method as claimed in claim 1 or claim 2, wherein said orifices are arranged such that said filaments, upon being extruded and adhered together, are positioned to form a transverse cross-sectional configuration including an outer shell portion formed of mutually adhered filaments, and a plurality of projections formed of mutually adhered filaments, said projections being integrally joined at respective bases thereof to said outer shell portion at equal angularly spaced intervals, said projections extending centripetally toward the axial center of the cross-section, at least of portion of said projections at equal angularly spaced intervals extending fully to said center and being joined thereat, and said fluid channels being between said projections.

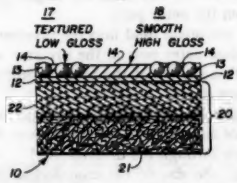
7. A method as claimed in claim 6, wherein said orifices are arranged to form a total of five said projections, all of said projections extending fully centripetally to join a said filament disposed longitudinally at said center, each said projection being of the shape of an isosceles triangle with the base thereof joined to said outer shell portion.

4,547,245

METHOD FOR MAKING DECORATIVE LAMINATE

Timothy D. Colyer, Columbia, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Division of Ser. No. 403,032, Jul. 29, 1982, Pat. No. 4,456,643. This application Apr. 16, 1984, Ser. No. 600,533
Int. Cl.[4] B31F *1/00*; B32B *3/00, 5/16*; B05D *5/00*
U.S. Cl. 156—220 **22 Claims**



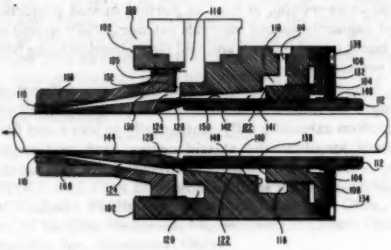
1. A method for making a decorative laminate having differential surface texture and differential surface gloss suitable as a floor covering, said method comprising:
applying to a substrate material a vinyl plastisol composition;
applying a layer of PVC resin particles of type GP PVC resin having a particle size diameter between about 4 mils and about 20 mils, a cell classification number of 4 and a plasticizer absorption greater than about 40 over said vinyl plastisol composition on the surface of said substrate;
heating said substrate to gel said vinyl plastisol thereon and thereby firmly adhere said PVC resin particles to said vinyl composition;
forming a top resinous layer on said PVC resin particles by applying a transparent synthetic organic polymer over said PVC resin particles;
heating the resulting top resinous layer thereby to provide a fused decorative laminate; and
embossing said decorative laminate to provide a relief pattern on the surface thereof characterized by raised segments having said PVC resin particles and recessed segments not having said PVC resin particles;
whereby the raised segments of said decorative laminate overlying said PVC resin particles exhibit a rougher surface texture and a lower gloss than the recessed segments of said decorative laminate.

4,547,246

EXTRUSION METHOD

Montri Viriyayuthakorn, Hamilton Township, Mercer County, N.J., and Robert V. DeBoo, Atlanta, Ga., assignors to AT&T Technologies, Inc., New York, N.Y.

Division of Ser. No. 413,301, Aug. 31, 1982, Pat. No. 4,495,022.
This application Dec. 19, 1983, Ser. No. 562,888
Int. Cl.[4] B29C *19/00*; B29D *9/04, 23/04*; H01B *7/02*
U.S. Cl. 156—244.12 2 Claims



1. A method of jacketing a cable or other workpiece comprises:

(1) drawing the workpiece through a diverter having a circumferentially and axially extending cavity therein said cavity including an adjustable contraction gap through which extrudate must pass before being shaped and sized in a die section of the cavity, and wherein the gap is nonuniform, there being a divergence of $\frac{1}{2}°$ to 5° of members forming the gap such that the gap is smallest proximate the entry port for the extrudate and largest 180° circumferentially from the entry port;

(2) forcing extrudate fluid into the diverter cavity through an extrudate entry port in the diverter which communicates with a section of the cavity prior to the adjustable contraction gap;

(3) allowing extrudate to flow out of an annular extrudate exit orifice and to be drawn down over the workpiece as it is drawn through the diverter; and

(4) adjusting the size of the contraction gap until desired uniformity of extrudate jacket over the workpiece is achieved for the given extrudate and operating parameters.

4,547,247

PLASMA REACTOR CHUCK ASSEMBLY

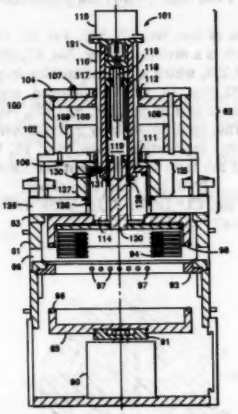
Douglas H. Warenback, San Rafael; Thomas M. Rathmann, Rohnert Park, and Ninko T. Mirkovich, Novato, all of Calif., assignors to Tegal Corporation, Novato, Calif.

Filed Mar. 9, 1984, Ser. No. 588,031
Int. Cl.[4] C23F *1/02*; B44C *1/22*; C03C *15/00*
U.S. Cl. 156—345 7 Claims

3. A plasma processing machine comprising:

a vacuum containment vessel having an upper plate with an aperture therein and containing a wafer transport mechanism;

a plasma reactor adapted to seal to said upper plate around a periphery of said aperture; and



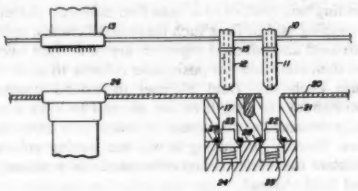
a chuck adapted to lower into said vacuum containment to interface with said wafer transport mechanism and to raise to seal to said upper plate.

4,547,248

AUTOMATIC SHUTOFF VALVE

Roger B. Lachenbruch, Petaluma, and John P. Zajac, San Jose, both of Calif., assignors to Tegal Corporation, Novato, Calif.

Filed Mar. 12, 1984, Ser. No. 588,854
Int. Cl.[4] B44C *1/22*; C03C *15/00*; C23C *13/08*
U.S. Cl. 156—345 4 Claims



1. In equipment for processing semiconductor wafers with a plasma having a reactor chamber and one or more gas lines associated with said chamber, the improvement comprising:

a connector block interposed in said gas lines; and

automatic shutoff valves in said block for closing said lines upon disconnection from said block.

4,547,249

SENSOR FOR LABEL TRANSPORTING EQUIPMENT

Joachim Dudzik, Vor dem Klingler 1, 7440, Nürtingen, and Winfried Dudzik, Drosselweg 13, 7441, Neckartailfingen, both of Fed. Rep. of Germany

Filed Mar. 23, 1984, Ser. No. 593,044
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310839
Int. Cl.[4] B65C *9/18*
U.S. Cl. 156—363 16 Claims

1. In apparatus for transporting a band along a predetermined path, said band having a first and second side and carrying a series of labels separated by gaps from one another on said first side, each of said labels having a leading and a trailing edge in the direction of transport of said band:

scanning means located in operative vicinity of said band at a predetermined location along said predetermined path for generating a scanning output signal when a label is in a predetermined position relative thereto, said scanning means comprising

backing means arranged along said second side of said band at said predetermined location;

feeler means positioned opposite said backing means and riding on said first side of said band for moving from a rest to an activating position in response to sensing of a selected one of said edges;

means coupled to said feeler means for generating said scanning output signal when said feeler means moves from said rest to said activating position;

wherein said means for generating said scanning output signal comprises switch means operative in a first and second state and furnishing said scanning output signal when in said first state, and coupling means connected to said feeler means and said switch means for moving said switch means to said first state when said feeler means is in said activating position; and

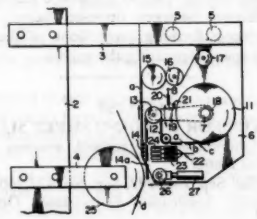
further comprising delay means coupled to said scanning means for maintaining said switch means in said first state for a predetermined time interval following return of said feeler means to said rest position.

4,547,250

APPARATUS FOR AFFIXING LABELS TO MOVING WEB

Kosho Murayama, Kawasaki, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha, Japan

Filed Oct. 3, 1983, Ser. No. 538,519
Claims priority, application Japan, Oct. 8, 1982, 57-177171
Int. Cl.[4] B65C *9/18, 9/46*
U.S. Cl. 156—384 **12 Claims**



1. Apparatus for affixing labels to a moving web, comprising:

(a) means for supplying a label tape, said label tape comprising a base strip and a multiplicity of labels removably adhered to said base strip;

(b) a resiliently supported movable roller being movable from a normal position to a shifted position, said label tape being passed from said supplying means around said movable roller;

(c) label separating means, said label tape being passed from said movable roller through said label separating means, said label separating means abruptly reversing the direction of said base strip causing said labels to be partially separated from said base strip;

(d) drive roller means, said drive roller means causing said base strip to pass through said label separating means;

(e) stamping means adapted to apply a marking on said labels, said stamping means being disposed adjacent the path of movement of said label tape from said movable roller to said label separating means;

(f) web guide means disposed adjacent said label separating means, said web guide means causing a web to pass adjacent said partially separated labels;

(g) a pressure roller disposed adjacent said label separating means at the opposite side of said partially separated labels from said web guide means,

(h) actuating means causing said pressure roller to press against said web guide means causing a marked and partially separated label to be affixed to said web, said movable roller moving from said normal position toward said label separating means to said shifted position to absorb an abrupt variation in tension of said label tape caused by the affixing of said marked and partially separated label to said web; and

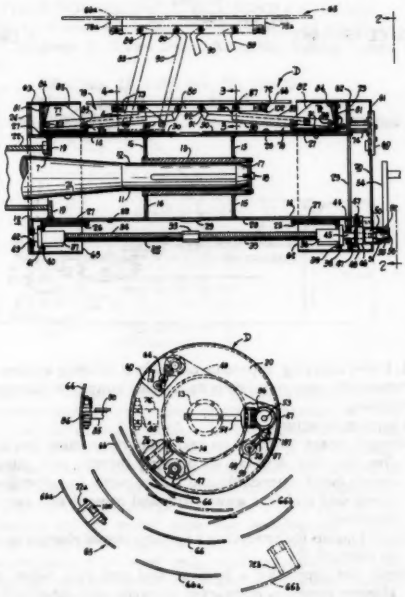
(i) means for braking said supplying means, said braking means being released when said movable roller moves from said shifted position to said normal position.

4,547,251

ADJUSTABLE TIRE BUILDING DRUM

Clifford A. Landsness, Akron, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Dec. 29, 1983, Ser. No. 566,609
Int. Cl.[4] B29H *17/16*
U.S. Cl. 156—415 **3 Claims**



1. In a tire building drum having a central hub means mounted for rotation about a horizontal axis, a series of seg-

ments mounted on said hub means to form an outer peripheral shell, and actuating means for moving the segments radially to adjust the diameter of the segmental shell, the improvement which comprises:

(a) at least nine segments regularly spaced around the drum to form an axially elongated generally cylindrical shell, each of said segments comprising an axially elongated member of arcuate cross section having a series of laterally projecting finger portions at opposite sides thereof which interfit with fingers of the next adjacent segment and overlap that segment when the shell is contracted,

(b) a pair of carriages for each segment mounted to move axially on said hub means,

(c) link means for each segment including a pair of rigid cantilever links to move the segment radially and stabilizing means to maintain the segment in a position parallel to the drum axis, each of said cantilever links being pivotally mounted on one of said carriages at one end and pivotally connected to the associated segment at the opposite end so as to swing radially in response to axial movement of said carriage means, and

(d) means for gradually moving the two carriages of each segment toward each other to effect simultaneous movement of all of the segments from retracted positions adjacent said hub means wherein the shell has a minimum diameter to advanced positions wherein said shell has an effective diameter at least 80 percent greater than said minimum diameter.

4,547,252

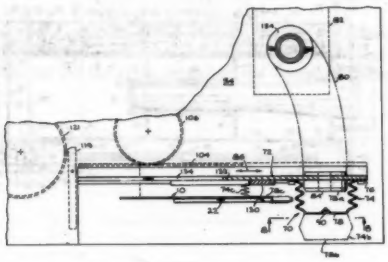
LABEL APPLYING APPARATUS FOR AUTOMATIC LABELING SYSTEM

Herbert LaMers, Ventura Labeling System, 2317 Palma Dr., Ventura, Calif. 93003

Division of Ser. No. 357,921, Mar. 15, 1982, Pat. No. 4,554,180, which is a continuation of Ser. No. 134,626, Mar. 27, 1980, abandoned, which is a division of Ser. No. 866,455, Jan. 3, 1978, Pat. No. 4,217,164. This application Mar. 20, 1984, Ser. No. 591,462

Int. Cl.⁴ B65C *9/18, 9/36*

U.S. Cl. 156—497 **9 Claims**



1. Label applying apparatus useful in a labeling system for automatically applying labels to articles conveyed therepast, comprising:

a support structure;

plunger means mounted on said support structure having a free end face defining an opening therein, said plunger means being extendable and contractable to respectively move said end face away from and toward said support structure;

control means for producing a vacuum in said plunger means to contract it;

means for supplying a label at said end face when said plunger means is contracted whereby said label will be held against said opening by the vacuum in said plunger means;

check valve means associated with said end face opening for pemitting air flow therepast into said plunger means and for preventing air flow therepast out of said plunger means; and wherein

said control means includes means for supplying gas pressure in said plunger means against said check valve means to thereby expand said plunger means to thrust said end face and label against an article.

4,547,253

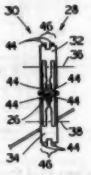
DEVICE FOR MAKING GROOVES IN CIGARETTE FILTERS

Richard Heaney, Campbell, and Steven P. Reed, Felton, both of Calif., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Jul. 18, 1984, Ser. No. 631,962

Int. Cl.⁴ A24C *5/50*

U.S. Cl. 156—553 **4 Claims**



1. A device for making four elongated grooves in the peripheral surface of filter rods equally spaced apart from each other about the circumference of the filter rod comprising:

one pair of groove forming rollers, the rotational axes of the rollers being generally parallel, the rollers being substantially in a common plane, and the periphery of the rollers being spaced apart by a predetermined distance greater than the diameter of a filter rod to be grooved;

a plurality of elongated, generally arcuately shaped groove forming projections mutually spaced apart around the circumference of each roller and generally radially extending from the periphery of each roller, each groove forming projection of one roller moves into and out of opposed facing, coextensive, aligned relationship with a different one of the groove forming projections of the other roller across the space separating the peripheries of the rollers as the rollers rotate; the groove forming projections of each roller are arranged in groups of two spaced apart, generally side by side groove forming projections, and the two grooves forming projections of each group of grooves are spaced apart by a distance substantially equal to the distance between opposed facing, coextensive, aligned groove forming projections of the two rollers across the space separating the rollers.

4,547,254

APPARATUS FOR BONDING SHEET MATERIAL

Kurt Berner, Obermuhen, Switzerland, assignor to Ecoboard Limited, Saint Helier

Filed Sep. 24, 1982, Ser. No. 422,740

Claims priority, application Switzerland, Oct. 22, 1981, 6756/81

Int. Cl.⁴ B32B *31/12*

U.S. Cl. 156—555 **6 Claims**

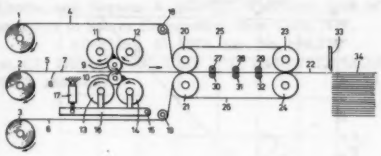
1. Apparatus for adhesively joining a plurality of flexible webs of material comprising:

two first rolls having rigid surfaces, capable of being set in rotation and being pressed against one another, for applying an adhesive to one or both sides of a web of material to be coated with adhesive,

four second rolls having flexible surface coverings, disposed laterally relative to said first rolls and in contact therewith

during operation, for homogeneously distributing said adhesive on said first rolls,

at least one feed means for said adhesive, and



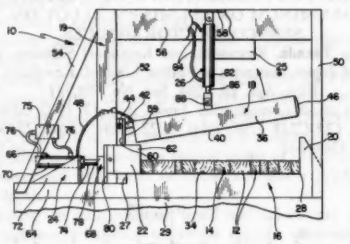
a pressing arrangement for adhesively joining said webs of material.

4,547,255

PRESS CONSTRUCTION

Larry R. Yow, North Wilkesboro, N.C., assignor to Modern Globe, Inc., North Wilkesboro, N.C.

Filed Oct. 9, 1984, Ser. No. 660,001
Int. Cl.[4] B30B *15/06*
U.S. Cl. 156—580 **5 Claims**



1. A press for securing a plurality of workpiece elements of substantially the same thickness in pressurized engagement during a gluing operation in substantially side-by-side, coplanar relation to define a composite workpiece, said press comprising:

a. a bed having a substantially flat bed surface thereon, said bed surface having a pair of spaced substantially opposite edges;

b. a plurality of spaced pusher shoes mounted adjacent a first of said edges and movable toward the second of said edges;

c. means for urging said pusher shoes toward said bed surface second edge;

d. means for retaining said workpiece elements on said bed surface against movement toward said bed surface second edge;

e. a platen attached to said press having a main portion and a plurality of platen fingers which extend from said main portion in substantially parallel spaced relation for receiving said pusher shoes therebetween, said platen having a substantially flat platen surface thereon which extends across said main portion and said fingers, and being positionable in an operative position wherein said platen surface is in substantially parallel, face-to-face spaced relation with said bed surface and wherein said pusher shoes are receivable between said fingers;

f. means for urging said platen toward said bed surface when said platen is in the operative position thereof; and

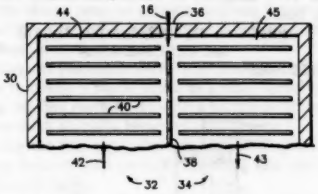
g. whereby when said workpiece elements are disposed and oriented in said composite position so that at least one of said workpiece elements is in communication with said retaining means so that said pusher shoes are receivable in communication with another of said workpiece elements, and so that forces applied to said elements by said pusher shoes and said retaining means urge said elements together, said workpiece elements are secured in pressurized engagement in said composite position when said platen is in the operative position thereof and said platen urging means and said pusher shoe urging means are actuated.

4,547,256

METHOD FOR THERMALLY TREATING A SEMICONDUCTOR SUBSTRATE

Richard W. Gurtler, Mesa; Ronald N. Legge, Scottsdale, and Israel A. Lesk, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 20, 1982, Ser. No. 450,898
Int. Cl.[4] C30B *1/04*
U.S. Cl. 156—603 **12 Claims**



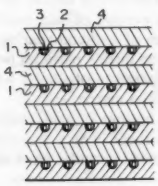
11. A process for thermally treating a semiconductor substrate which comprises the steps of: isothermally heating said substrate to a first elevated termperature; locally heating said substrate to a second temperature higher than said first elevated temperature to create a localized molten zone; and isothermally cooling said substrate to a third temperature lower than said second temperature.

4,547,257

METHOD FOR GROWING DIAMOND CRYSTALS

Eiichi Iizuka; Tomoji Sando, and Shinji Kashima, all of Shiojiri, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 25, 1984, Ser. No. 654,295
Int. Cl.[4] C30B *29/04*
U.S. Cl. 156—603 **8 Claims**



1. An improvement in a method for growing diamond crystals which comprises subjecting reaction materials of nondiamond carbon, a solvent metal, and diamond particles as the seeds, to pressure and temperature conditions in the diamond-stable region, wherein the reaction materials are in the form of a pair of a superimposed solvent metal plate and a nondiamond carbon plate or a pile made of a plurality of said pairs of the superimposed solvent metal plate and nondiamond carbon plate, a plurality of the diamond particles being disposed on either one or each of the confronting surfaces of the pair of the superimposed solvent metal plate and nondiamond carbon plate; or the reaction materials are in the form of a plate made of a mixture of the solvent metal and the nondiamond carbon or a pile made of a plurality of the solvent metal/nondiamond carbon mixture plates, a plurality of the diamond particles

being disposed on a surface of each solvent metal/nondiamond carbon mixture plate,

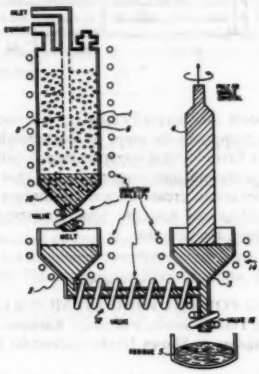
said improvement comprising regularly disposing diamond particles having a particle size of not larger than 50 μm in such a manner that the diamond particles are located at a substantially equal distance and the distance between the peripheries of every two adjacent grown diamond crystal particles is in the range of 50 to 300 μm; and allowing the diamond crystals to grow until their sizes reach at least five times the size of the seed particles.

4,547,258

DEPOSITION OF SILICON AT TEMPERATURES ABOVE ITS MELTING POINT

David E. Witter, Richardson, and Mohendra S. Bawa, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 22, 1982, Ser. No. 452,173
Int. Cl.⁴ C30B *15/04*
U.S. Cl. 156—605 **14 Claims**



1. A process for producing silicon from a silicon bearing gas flow, comprising the steps of:

providing a matrix of silicon nitride particles;

forcing through a portion of said matrix of silicon nitride particles a stream of a silicon bearing gas mixture;

said matrix of silicon nitride particles being heated to above the melting temperature of silicon while said gas flow is forced through said matrix; and

collecting, at the bottom of said matrix of silicon nitride particles, liquid silicon which was deposited on said matrix of silicon nitride particles from said gas stream.

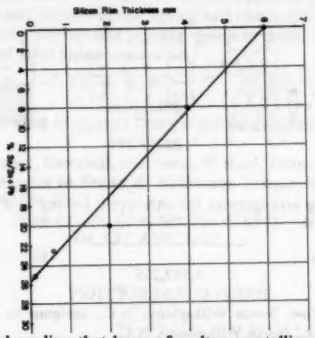
4,547,259

MANUFACTURE OF SHEETS OF CONTROLLED THICKNESS FROM MELTABLE MATERIAL

William A. Santini, Jr., Kittanning, Pa., assignor to Silicon Electro-Physics, Inc., Bradford, Pa.

Continuation-in-part of Ser. No. 242,498, Mar. 10, 1981, abandoned. This application Jun. 6, 1983, Ser. No. 501,221
Int. Cl.⁴ C30B *9/10*
U.S. Cl. 156—607 **6 Claims**

1. In the method of forming sheets of controlled thickness from molten crystalline material on a support layer containing molten lead the improvement comprising supplying molten crystalline material to the support layer so that said material flows out thereon as a layer free to advance to its uniform equilibrium thickness thereon, reducing that layer thickness by adding to the support layer a minor proportion of a benign substance soluble therein which effectively reduces the equilibrium thickness of the molten crystalline material on the support



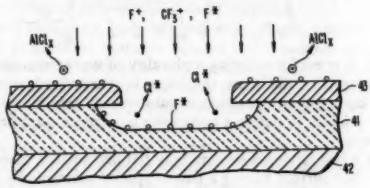
layer and cooling that layer of molten crystalline material to solidify it to a sheet of said reduced equilibrium thickness.

4,547,260

PROCESS FOR FABRICATING A WIRING LAYER OF ALUMINUM OR ALUMINUM ALLOY ON SEMICONDUCTOR DEVICES

Tadakazu Takada, Kawasaki, and Katsunori Shimizu, Tokyo, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Apr. 10, 1984, Ser. No. 598,741
Claims priority, application Japan, Apr. 13, 1983, 58-64719
Int. Cl.⁴ C23F *1/02*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—643 **24 Claims**



1. A process for patterning an aluminum or aluminum alloy wiring layer formed on a semiconductor device, said process comprising the steps of:

(a) a first dry etching step for selectively removing a part of the aluminum or aluminum alloy wiring layer using a first gas selected as one of chlorine and a chlorine compound;

(b) exposing the aluminum or aluminum alloy wiring layer to a plasma generated by discharge in a second gas selected as one of fluorine and a fluorine compound; and

(c) a second dry etching step for selectively removing a further portion of the aluminum or aluminum alloy wiring layer using said first gas.

4,547,261

ANISOTROPIC ETCHING OF ALUMINUM

Jer-shen Maa, Plainsboro, N.J., and Bernard Halon, Kings County, N.Y., assignors to RCA Corporation, Princeton, N.J.

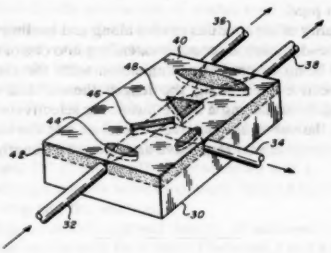
Filed Sep. 28, 1984, Ser. No. 655,692
Int. Cl.⁴ C23F *1/00*; B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—643 **8 Claims**

7. In a process of plasma etching aluminum or an alloy thereof on a substrate with an etchant gas, the improvement comprising utilizing as the etchant gas a mixture of boron trichloride, nitrogen and a halogenated fluorocarbon.

4,547,262
METHOD FOR FORMING THIN FILM PASSIVE LIGHT WAVEGUIDE CIRCUIT

William Spillman, Jr., Charlotte, Vt.; Richard A. Soref, Newton Centre, and Norman A. Sanford, Worcester, both of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 30, 1984, Ser. No. 646,338
Int. Cl.[4] H01L *21/306*; C23F *1/02*; B44C *1/22*; G02B *5/14*
U.S. Cl. 156—659.1 13 Claims



12. A method for forming an integrated light waveguide circuit in an optical substrate having a first index of refraction, comprising the steps of:

providing a substrate of $LiTaO_3$,

cleaving said substrate to provide a major planar surface along an x—y plane,

exposing said major surface to an acid bath for a first predetermined time period at a first predetermined temperature,

annealing said substrate for a second predetermined time period at a second predetermined temperature to form a planar region having a second index of refraction greater than said first index of refraction and a predetermined depth.

forming an etch resistant mask and selectively patterning said major surface to define regions of predetermined optical geometry, and

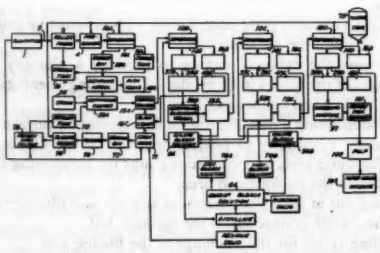
exposing said major surface to said acid bath for a third predetermined time period exceeding said first predetermined time period,

said third period being of sufficient duration to provide said regions of predetermined optical geometry with a third refractive index and a depth substantially equal to said predetermined depth of said planar region.

4,547,263
METHOD FOR OBTAINING USEFUL PRODUCTS FROM GREEN PSEUDOSTEM, INCLUDING PAPERMAKING PULP PLANTAIN

Babington A. Quame, 331 E. 29th St., New York, N.Y. 10016

Filed Feb. 28, 1983, Ser. No. 470,198
Int. Cl.[4] D21C *1/02, 3/26, 9/10, 9/18*
U.S. Cl. 162—14 4 Claims



1. A method for obtaining useful products, including pulp for papermaking, from green plantain pseudostem, comprising the steps of:

compressing the green plantain pseudostem to obtain a liquid as a first useful product which contains amino acids, starch, and organic salts useful as plant food and fertilizer and partially defluidized plantain pseudostem;

beating the partially defluidized plantain pseudostem with water to convert the same into a fine slurry;

squeezing the fine slurry to obtain additional first useful liquid product and fibrous material formed of plantain pseudostem;

subjecting the fibrous plantain pseudostem material to a depithing treatment to obtain depithed fine mesh fibers and parenchyma pith cells separated therefrom, the pith cells constituting a second useful product;

mixing the depithed fine mesh fibers with an alkaline solution to obtain a slurry mass of fine mesh fibers and subjecting the slurry mass to a steam cooking treatment to dissolve lignin and other soluble substances contained therein to obtain a cooked mass,

separating the fine mesh fibers from the liquid of the cooked mass to obtain a black liquor as a third useful product;

beating the fine mesh fibers with a bleach solution to obtain a fine mesh partially bleached pulp slurry;

squeezing the fine mesh slurry to separate additional black liquor from at least partially bleached fine mesh fibers of alpha cellulose;

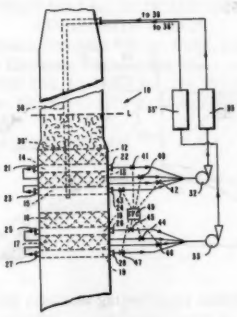
depithing the alpha cellulose; and

kneading the bleached alpha cellulose to strengthen and give the pulp a smooth, soft texture to thereby obtain substantially pure alpha cellulose pulp for papermaking as a fourth useful product.

4,547,264
METHOD OF WITHDRAWING LIQUID FROM A PAIR OF VERTICALLY SPACED ANNULAR SCREENS

Michael I. Sherman, and Joseph R. Phillips, both of Glens Falls, N.Y., assignors to Kamyr, Inc., Glens Falls, N.Y.

Continuation of Ser. No. 172,973, Jul. 28, 1980, abandoned, which is a continuation of Ser. No. 11,662, Feb. 12, 1979, abandoned. This application May 12, 1981, Ser. No. 263,082
Int. Cl.[4] D21C *7/14*
U.S. Cl. 162—37 4 Claims



1. A method of withdrawing liquid from a pair of vertically spaced annular screens in a vertical vessel, each having an annular header associated therewith, and two circumferentially spaced liquid outlets being associated with each header, so that first and second headers each having first and second outlets, are provided, each header providing substantially circumferentially continuous cavity free of circumferential dividing members; said method comprising the steps of substantially sequentially

(a) withdrawing liquid from the first header outlet;

(b) terminating withdrawal of liquid from the first header

first outlet and withdrawing liquid from the second header first outlet;

(c) terminating withdrawal of liquid from the second header first outlet and withdrawal liquid from the first header second outlet;

(d) terminating withdrawal of liquid from the first header second outlet and withdrawal liquid from the second header second outlet; and

(e) repeating steps (a)–(d), and with appropriate frequency to minimize header blockage caused by deposited debris and scale.

4,547,265

METHOD FOR SIZING PAPER USING HYDROLYZED HOMOPOLYMERS OR COPOLYMERS OF META- OR PARA-ISOPROPENYL-α,α-DIMETHYLBENZYLISOCYANATE

Peter S. Forgione; Balwant Singh, and John A. Sedlak, all of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jun. 1, 1983, Ser. No. 499,942

Int. Cl.⁴ D21H *3/48*

U.S. Cl. 162—164.6 **12 Claims**

1. A method of sizing paper, comprising applying thereto a sizingly effective amount of a polymer selected from the group consisting of:

(a) homopolymers of meta- or para-isopropenyl-α,α-dimethylbenzylamine;

(b) copolymers of (i) meta- or para-isopropenyl-α,α-dimethylbenzylamine and (ii) at least one other ethylenically unsaturated monomer copolymerizable therewith, wherein said copolymer contains at least one weight percent repeating units derived from the amine comonomer (i); and

(c) acid salts of said hompolymers (a) and copolymers (b).

4,547,266

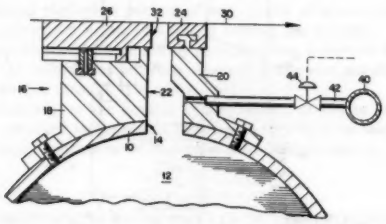
APPARATUS FOR PROVIDING SELECTIVELY DIFFERENTIATED VACUUM ACROSS A PAPERMAKING MACHINE WIDTH

Martin B. Keller, and Roger A. Ahrens, both of Hudson Falls, N.Y., assignors to Sandy Hill Corporation, Hudson Falls, N.Y.

Filed Jul. 29, 1983, Ser. No. 518,465

Int. Cl.⁴ D21C *1/48*

U.S. Cl. 162—252 **1 Claim**



1. In a Fourdrinier papermaking machine, the combination of:

a travelling Fourdrinier forming wire,

means fo depositing a layer of paper stock in a web-forming condition on the top wire surface,

a vacuum source,

a vacuum pipe having an interior connected to the vacuum source and extending laterally across and beneath the wire,

a longitudinal through slot along the upper surface of the vacuum pipe,

a cover mounted on the upper surface of the vacuum pipe including a pair of spaced lands extendable along the length of the vacuum pipe for defining an upwardly facing throat therebetween in alignment and communication with the vacuum pipe through slot,

a pair of spaced wear strips each mounted on the top of a respective land of the pair thereof for supporting the wire traversible therepast with the space between the strips defining a slot in alignment and communication with the upwardly-facing throat,

a pressurized air header extending transversely across and beneath the wire and in spaced parallelism with the vacuum pipe,

a plurality of air conduits spaced along and leading from the air header, each air conduit extending into one of the lands and being in open communication with the throat in a respective area along the length thereof and each air conduit containing a valve means for selectively controlling the valves to selectively bleed air into the vacuum in the throat at said respective area along the length thereof.

4,547,267

PROCESS FOR PRODUCING A PHOTOOPTICAL SHUTTER BLADE FOR AN OPTICAL INSTRUMENT

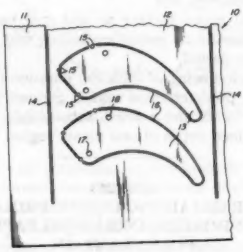
Klaus Goebert, and Ulrich Buering, both of Wetzlar, Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Aug. 24, 1983, Ser. No. 525,874

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151290; PCT Int'l Appl., Dec. 22, 1982, PCT/DE82/00232

Int. Cl.⁴ C25D *1/20*

U.S. Cl. 204—4 **1 Claim**



1. A process for producing a photooptical shutter blade for an optical instrument, comprising the steps of:

preparing a photomaster of a plurality of blades to be produced, including openings in the blades, and connecting lugs;

exposing a metallic plate coated with a photosensitive material through the photomaster;

developing the exposed surface to produce a plurality of images of the blades to be produced, including openings in the blades, and connecting lugs;

electrodepositing a metallic foil on the developed surface to produce a plurality of blades, openings in the blades, a background area, and connecting lugs for connecting the blades to the background area;

carrying out at least one treatment step on said plurality of blades while connected to the metallic foil;

providing rivets for the openings in the blades; and

separating the individual blades from said foil.

4,547,268

PROCESS FOR THE PRODUCTION OF GALVANIZED STEEL SHEET PROTECTED BY CHROMIUM AND CHROMIUM OXIDE LAYERS

Roberto Bruno, and Massimo Memmi, both of Rome, Italy, assignors to Zincroksid S.p.A., Turin, Italy

Filed Feb. 10, 1984, Ser. No. 579,078
Claims priority, application Italy, Mar. 21, 1983, 47950 A/83
Int. Cl.[4] C25D *7/06*
U.S. Cl. 204—28 3 Claims

1. Process for the production of coated steel sheet, comprising depositing on a galvanized steel sheet a protective layer of chromium and oxides of chromium, comprising:

continuously immersing a galvanized steel strip in an aqueous solution containing from 110 to 170 g/l CrO^{2-} ions, from 0.7 to 1.4 g/l SO_4^{2-} ions, from 0.4 to 1.0 g/l Cr^{3+} ions, from 0.5 to 1.1 g/l F^- ions and from 0.01 to 2 g/l BF_4^- ions, the solution being at a temperature of between 40° and 55° C. and a pH of between 0.3 and 1,

maintaining a relative velocity of more than 0.5 m/s between the strip and the solution,

imposing a cathodic current density of between 40 and 80 A/dm^2 on the strip for a time of between 2 and 6 seconds,

removing the strip from said first solution, eliminating most of the adhering solution,

continuously immersing the strip thus obtained in a second aqueous solution containing from 33 to 52 g/l Cr_4^{2-} ions, from 0.4 to 1.0 g/l Cr^{3+} ions, from 0.6 to 1.6 g/l SO_4^{2-} ions, from 0.5 to 1.1 g/l F^- ions and from 0.01 to 2 g/l BF_4^- ions, the second solution being at a temperature of between 20° and 35° C. and a pH between 3 and 4.5,

maintaining a relative velocity of more than 0.5 m/s between the strip and the second solution,

imposing a cathodic density of between 10 and 25 A/dm^2 on the strip for a time of between 5 and 20 seconds, and

removing the strip from said second solution and rinsing the drying it.

4,547,269

METHOD OF ELECTRODEPOSITING ZINC ON STEEL PRIOR TO PHOSPHATING

Werner Raüsch, Oberursel, and Gerhard Müller, Hanau am Main, both of Fed. Rep. of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 21, 1984, Ser. No. 653,504
Claims priority, application Fed. Rep. of Germany, Sep. 28, 1983, 3335009
Int. Cl.[4] C25D *3/22, 5/48*
U.S. Cl. 204—34 6 Claims

5. A process for treating a steel object which comprises the steps of:

(a) pickling at least a surface of said object;

(b) electrodepositing zinc on said surface from a zinc-containing sulfuric acid electrolyte solution to form a zinc coating on said surface;

(c) limiting pitting of said coating by adding to said solution at least one oxyacid of sulfur in which sulfur has an oxidation number of +5 to +1 in an amount of 0.05 to 10 g/l of said solution and sufficient to limit pitting; and

(d) phosphatizing the resulting zinc coating to form a phosphate coating on the zinc which is substantially free from spots.

4,547,270

ELECTROCHEMICAL POLYMERIZATION OF PYRROLES, AN ANODE FOR CARRYING THIS OUT, AND PRODUCTS OBTAINED BY THIS PROCEDURE

Herbert Naarmann, Wattenheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 23, 1984, Ser. No. 633,282
Claims priority, application Fed. Rep. of Germany, Jul. 27, 1983, 3327012
Int. Cl.[4] C25B *3/02*
U.S. Cl. 204—58.5 6 Claims

1. A process for the electrochemical polymerization of a pyrrole or a mixture of a pyrrole with a comonomer by anodic oxidation of the monomers in solution or dispersion in an electrolyte solvent, in the presence of a conductive salt, with deposition of the pyrrole polymer on a sheet-like element of the anode, said anode consisting essentially of a porous, electrically non-conductive, sheet-like element which can be impregnated with said electrolyte solution or dispersion and one or more electrically conducting support and contact strips integral with and in functional relationship with said sheet-like element by electrically connecting said sheet-like element with the anode current supply.

4,547,271

PROCESS FOR THE ELECTROCHEMICAL REDUCTION OF 7-KETOLITHOCHOLIC ACID TO URSODEOXYCHOLIC ACID

Kekhusroo R. Bharucha, and Clarke E. Slemon, both of Toronto, Canada, assignors to Canada Packers Inc., Canada

Filed Sep. 12, 1984, Ser. No. 649,682
Int. Cl.[4] C25B *3/00*
U.S. Cl. 204—59 R 16 Claims

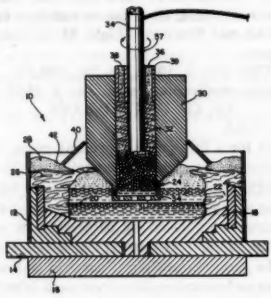
1. A process for producing ursodeoxycholic acid or its methyl ester comprising electrochemical reducing 7-ketolithocholic acid or its methyl ester in a solution comprising an electrolyte and a weakly acid and highly polar solvent which promotes stereoselectivity to ursodeoxycholic acid such that the ratio of ursodexoycholic acid or its methyl ester to chenodeoxycholic acid or its methyl ester produced by the process is greater than 1:1.

4,547,272

METHOD AND APPARATUS FOR PRODUCTION OF A METAL FROM METALLIC OXIDE ORE USING A COMPOSITE ANODE

Jack Y. Josefowicz, Westlake Village, Calif., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Dec. 14, 1983, Ser. No. 561,496
Int. Cl.[4] C25C *3/00, 3/12, 3/04, 3/06*
U.S. Cl. 204—67 26 Claims



15. A process for electrolytically depositing a metal from a molten electrolyte comprising the steps of introducing particulates of an oxygen-containing compound of said metal and

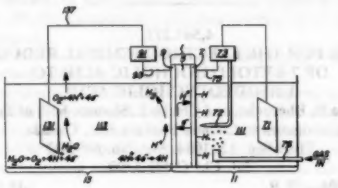
particulates of a reducing agent into a container immersed in said molten electrolyte, providing an electrical current to said particulates of said metal compound of and said reducing agent, and compressing said particulates to greater than atmospheric pressure—said metal compound having a particle size of between about 100 and about 400 mesh and said reducing agent having a particle size between about 5 and about 50 mesh.

4,547,273

MOBILE ATOM INSERTION REACTION, MOBILE ATOM TRANSMISSIVE MEMBRANE FOR CARRYING OUT THE REACTION, AND REACTOR INCORPORATING THE MOBILE ATOM TRANSMISSIVE MEMBRANE

William Ayers, Princeton, N.J., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jun. 7, 1984, Ser. No. 618,014
Int. Cl.[4] C25B *11/00*; C01C *1/04*; C01B *21/16, 15/01*
U.S. Cl. 204—73 R 40 Claims



1. A method of chemically inserting hydrogen into a reactant comprising:

a. absorbing hydrogen on one side of an atomic hydrogen transmissive membrane;

b. passing atomic hydrogen through the membrane to an opposite insertion reaction side thereof;

c. adsorbing a reactant onto the insertion reaction side of the membrane;

d. chemically reacting the adsorbed reactant with the hydrogen passed through the membrane; and

e. evolving the hydrogen insertion reaction product.

4,547,274

SUPPORT FOR LITHOGRAPHIC PRINTING PLATE AND LITHOGRAPHIC PRINTING PLATE

Azusa Ohashi; Hirokazu Sakaki; Haruo Nakanishi, all of Shizuoka; Zenichi Tanabe, Aichi; Shin Tsuchida, Aichi, and Yoshikatsu Hayashi, Aichi, all of Japan, assignors to Fuji Photo Film Co., Ltd. and Sumitomo Light Metal Industries Ltd., both of, Japan

Filed Jun. 1, 1983, Ser. No. 500,203
Claims priority, application Japan, Jun. 1, 1982, 57-92080
Int. Cl.[4] C25F *3/00, 3/04*
U.S. Cl. 204—129.4 16 Claims

1. A support for a lithographic printing plate, which comprises an aluminum alloy material containing 0.20 to 1.0% Fe and 0.005 to 0.1% of at least one of the elements Sn, In, Ga and Zn and having at least on one surface thereof a unifrom and dense grain structure formed by subjecting its surface to a chemical etching treatment carried out using a material selected from the group consisting of an acid and an alkali and then to an electrochemical etching treatment in an acidic electrolytic solution containing a material selected from the group consisting of hydrochloric acid or its salt, nitric acid or its salt, and a mixture thereof and using current selected from the group consisting of DC and AC.

4,547,275

PROCESS FOR TREATING SURFACE OF ALUMINUM FOIL FOR USE AS ELECTRODE OF ELECTROLYTIC CAPACITORS

Tatsuhiko Ejima, Sendaishi; Kozo Arai, Sakaishi; Eizo Isoyama, Saishi, and Tadao Fujihira, Sakaishi, all of Japan, assignors to Showa Aluminum Kabushiki Kaisha, Osaka, Japan

Filed Jan. 28, 1985, Ser. No. 695,264
Claims priority, application Japan, Feb. 3, 1984, 59-18943
Int. Cl.[4] C25F *3/04*
U.S. Cl. 204—129.75 7 Claims

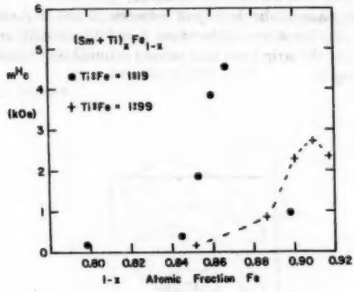
1. A process for treating the surface of aluminum foil for use as an electrode of electrolytic capacitors characterized in that the aluminum foil is subjected to an electrolytic pre-etching treatment in an aqueous solution containing hydrochloric acid and at least one compound selected from the group consisting of chromic acid and chromates, then to an intermediate nitric acid treatment, and thereafter to an electrolytic post-etching treatment in an aqueous solution containing hydrochloric acid, or hydrochloric acid and an oxidizing acid.

4,547,276

METHOD OF DIRECTLY CRYSTALLIZING A (SM+Ti):Fe=1:5 COMPOUND

Fred J. Cadieu, Flushing, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 30, 1984, Ser. No. 605,456
Int. Cl.[4] C23C *15/00*
U.S. Cl. 204—192 M 12 Claims



1. Method of synthesizing a metastable crystal phase at a composition corresponding to a (Sm+Ti):Fe=1:5 atomic ratio, said method comprising synthesizing a film by selectively thermalized sputtering onto heated substrates with the addition of titanium as a stabilizing agent.

4,547,277

OXYGEN SEPARATOR

William N. Lawless, c/o CeramPhysics, Inc., P.O. Box 346, Westerville, Ohio 43081

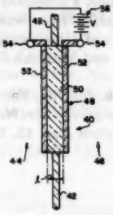
Continuation-in-part of Ser. No. 464,248, Feb. 7, 1983, Pat. No. 4,462,891. This application Jul. 12, 1984, Ser. No. 628,381
The portion of the term of this patent subsequent to Jul. 31, 2001, has been disclaimed.
Int. Cl.[4] C25B *13/04*
U.S. Cl. 204—252 7 Claims

1. An oxygen separator for separating oxygen from a first gas, comprising:

at least two layers of a porous metallic conductor;

at least one layer of an electrolytic ceramic material $Ni(Nb_{1-x}M_x)_2O_{6-x}$ wherein M is selected from the

group consising of Zr^{+4} and Ti^{+4}, Sn^{+4}, Sm^{+4}, Hf^{+4}, Ce^{+4} and mixtures thereof, and wherein x is from 0 to 0.2;



said ceramic layer being disposed between said metallic layers and cooperating therewith to form at least a portion of a body for separator; and

a voltage source connected between said metallic layers.

4,547,278

CATHODE FOR HYDROGEN EVOLUTION

Dale E. Hall, Monroe, and Douglas S. Brown, Tuxedo, both of N.Y., assignors to Inco Alloys International, Inc., Huntington, W. Va.

Filed Aug. 10, 1984, Ser. No. 639,811
Int. Cl.[4] C25B *11/00*
U.S. Cl. 204—290 R **11 Claims**

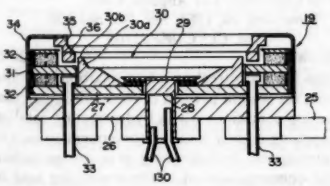
1. A cathode for electrogeneration of hydrogen from an aqueous alkaline electrolyte comprising an electroconductive substrate substantially inert in said electrolyte having on at least part of the surface thereof an adherent coating of metal particles bonded to said substrate by a sintered unfibrillated polymer selected from the group of polytetrafluoroethylene polyvinylidene fluoride, poly chlorotrifluoroethylene, fluorinated ethylene propylene polymer polyperfluoro-alkoxyethylene and silicones, said metal powder particles being particles of AB_N wherein A is one or more members of the group consisting of rare earth elements and calcium which can be replaced in part by zirconium or thorium or both, B is one or more members of the group consisting of nickel and cobalt which may be replaced up to 1.5 atom by one or more members of the group of aluminum, copper, tin, iron and chromium and N is a mumber between 4 and 8 with up to an equal weight of particles of a metal inert in said aqueous alkaline electrolyte.

4,547,279

SPUTTERING APPARATUS

Hideharu Kiyota, Tokyo, and Mitsuaki Horiuchi, Fuchu, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 544,729, Oct. 24, 1983, abandoned.
This application Nov. 21, 1984, Ser. No. 673,928
Claims priority, application Japan, Oct. 22, 1982, 57-184577
Int. Cl.[4] C23C *15/00*
U.S. Cl. 204—298 **28 Claims**



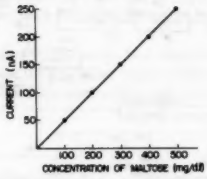
1. A sputtering apparatus comprising an anode, a target means arranged in opposition to said anode which is biased as a cathode, means for generating a magnetic field, and a shield disposed in proximity to said target means, said target means including a substantially flat surface at an outer marginal area thereof in proximity to said shield ring.

4,547,280

MALTOSE SENSOR

Yoshiharu Karasawa, Tokyo, and Yoshinori Takata, Chiba, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 26, 1984, Ser. No. 674,693
Claims priority, application Japan, Nov. 28, 1983, 58-222047
Int. Cl.[4] C12Q *1/40, 1/54*
U.S. Cl. 204—403 **3 Claims**



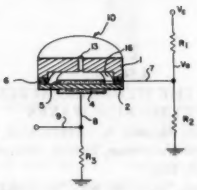
1. A maltose sensor which comprises an enzyme membrane having immobilized α-glucosidase and glucose oxidase and an electrode, the electrode being a hydrogen peroxide electrode provided with a palladium cathode.

4,547,281

GAS ANALYSIS APPARATUS

Da Y. Wang, Lexington, and Daniel T. Kennedy, Burlington, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation of Ser. No. 553,856, Nov. 21, 1983, abandoned.
This application May 2, 1985, Ser. No. 729,892
Int. Cl.[4] G01N *27/46*
U.S. Cl. 204—424 **18 Claims**



13. Apparatus comprising:

(a) a body of solid electrolyte material which exhibits ionic conduction in the presence of a gas;

(b) first and second electrodes permeable to said gas formed over opposite first and second surfaces of said body; and

(c) one of said electrodes comprising a composition of Bi in a predominant amount and an element selected from the group consisting of a rare element, an alkaline earth metal, Ga, Pb, In, Sn, Ti, Mo and W, and a conductive element.

4,547,282

COAL LIQUEFACTION AND HYDROGENATION

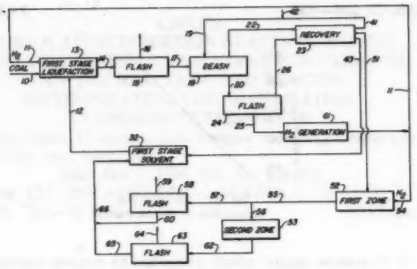
Harvey D. Schindler, Fair Lawn, N.J., assignor to Lummus Crest, Inc., Bloomfield, N.J.

Filed Apr. 30, 1984, Ser. No. 605,690
Int. Cl.[4] C10G *1/00*
U.S. Cl. 208—8 LE **21 Claims**

1. A two-step process for the liquefaction of coal, comprising:

contacting coal with a liquefaction solvent in a first stage to produce a liquefaction effluent containing 850° F.— mate-

rial and 850° F.+ material; recovering from the liquefaction effluent feed material comprising at least a portion of the 850° F.− material and 850° F.+ material; hydrogenating feed material in a second stage in first and second hydrogenating zones of said second stage, said first zone being operated at a temperature of from 650° F. to 795° F., the second zone being operated at a temperature of at least 800° F. and no greater than 840° F.; recovering from both the first and second zones a portion of 850° F.− material



as product; recovering from both the first and second zones a mixture of 850° F.− material and 850° F.+ material, said mixture having a weight ratio of 850° F.− material to 850° F.+ material of from 0.8:1 to 6:1; and directly employing said mixture, without additional hydrogenation, as at least a portion of the liquefaction solvent used in the first stage, said liquefaction solvent being comprised of from 0% to 40% of 850° F.− material from the first stage effluent, and from 60% to 100% of said mixture, all by weight.

4,547,283

PROCESS FOR THE HYDROISOMERIZATION OF PETROLEUM WAXES

Emmanuel E. A. Neel; Jacques A. Levavasseur, and Jacques P. Lucien, all of Grand-Couronne, France, assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 30, 1984, Ser. No. 646,278

Claims priority, application France, Oct. 14, 1983, 83 16372

Int. Cl.[4] C10G *49/02*

U.S. Cl. 208—46 **14 Claims**

1. A process for the hydroisomerization of petroleum waxes, wherein said waxes are contacted with hydrogen at isomerization conditions using a catalyst comprising at least one refractory oxide consisting of modified silica, wherein said silica has been treated with from 0.1 to 30 wt%, calculated on refractory oxide, of at least one reactive metal compound of Group 2a, 3a, 4a and 4b of the Periodic Table of Elements, wherein said silica is modified by (1) impregnating said silica with:

i. a solution of a hydrocarbyl ammonium metallate; or

ii. two solutions, wherein the first of said two solutions contains a hydrocarbyl ammonium hydroxide and the second of said two solutions contains said at least one reactive metal moiety or moieties selected from the group consisting of a moiety or moieties of said elements of Group 2a, 3a, 4a and 4b of the Periodic Table of Elements, and after said impregnation; (2) drying said modified silica at a temperature of from 50°–250° C.; (3) calcining said dried modified silica at a temperature of from 250°–1000° C; and (4) recovering the resultant modified silica for said hydroisomerization of said petroleum waxes.

4,547,284

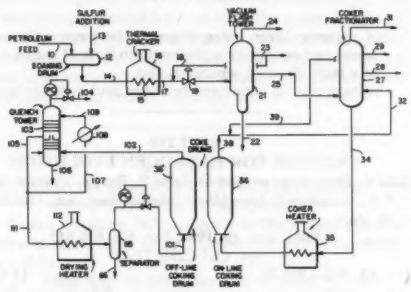
COKE PRODUCTION

Morgan C. Sze, Upper Montclair; Thomas M. Bennett, Scotch Plains; Andre A. Simone, Parsippany, all of N.J.; Dennis F. Ogren, Sao Paulo, Brazil; Mikio Nakaniwa, Ome, and Kenji Furukawa, Tokyo, both of Japan, assignors to Lummus Crest, Inc., Bloomfield, N.J. and Maruzen Petrochemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 348,921, Feb. 16, 1982, abandoned, which is a continuation-in-part of Ser. No. 214,378, Dec. 5, 1980, abandoned. This application Aug. 13, 1984, Ser. No. 640,228

Int. Cl.[4] C10G *9/14*

U.S. Cl. 208—50 **25 Claims**



1. In a process for the delayed coking of a coking feedstock wherein a coking feedstock is heated in a coking heater and introduced into a coke drum, and, after filling of the coke drum to the desired level, the coke drum is taken off-stream by discontinuing introduction of coking feedstock, the improvement comprising:

operating the coke drum at a temperature of from 415° C. to 455° C. prior to taking the coke drum off-stream; and subsequent to taking the coke drum off-stream, heating the contents of the off-stream coke drum at a temperature which is at least 10° C. greater than the prior coking temperature and which is from 450° C. to 500° C., said heating being effected for a time sufficient to provide a coke having a volatile combustible matter content of at least 4% and no greater than 10%, all by weight.

4,547,285

HYDROTREATING PROCESS WHEREIN SULFUR IS ADDED TO THE FEEDSTOCK TO MAINTAIN THE CATALYST IN SULFIDED FORM

Robert E. Miller, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Oct. 24, 1983, Ser. No. 544,826

Int. Cl.[4] C10G *45/04*

U.S. Cl. 208—89 **28 Claims**

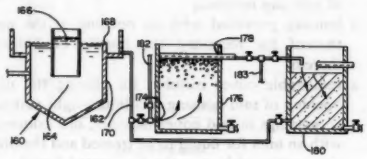
1. A process for hydrotreating a hydrocarbon oil containing less than about 0.1 weight percent of total sulfur, calculated as S, under reaction conditions with a hydrotreating catalyst, said process comprising adding a sulfur component to said hydrocarbon oil during said hydrotreating in a concentration such that the total concentration of sulfur contacting said hydrotreating catalyst during said hydrotreating is maintained at about 0.01 to about 0.1 weight percent, calculated as S.

4. The process defined in claim 1 further comprising cracking a substantial proportion of the effluent hydrocarbon oil from said hydrotreating.

4,547,286
WATER FILTRATION PROCESS AND APPARATUS HAVING UPFLOW FILTER WITH BUOYANT FILTER MEDIA AND DOWNFLOW FILTER WITH NONBUOYANT FILTER MEDIA

Andrew K. Hsiung, Corvallis, Oreg., assignor to Neptune Microfloc, Inc., Corvallis, Oreg.

Continuation-in-part of Ser. No. 171,151, Jul. 22, 1980, abandoned. This application Feb. 10, 1983, Ser. No. 465,524
Int. Cl.⁴ B01D *37/00*
U.S. Cl. 210—738 **20 Claims**



1. A filter system which includes;

a hollow main body and first and second upright spaced apart walls separating the main body into first, second, and third compartments, the first compartment comprising an upflow filter vessel which defines a vertical passageway for water and the third compartment comprising a downflow filter vessel, the second compartment comprising an intermediate cleaning well means for receiving cleaning liquid and removed deposited solids from the upflow and downflow filter vessels, the upflow filter vessel having an upflow filter inlet, having an upflow filter outlet above the buoyant filtration bed and communicating through the first wall to the cleaning well means, the downflow filter vessel having a downflow filter inlet communicating through the second wall to the cleaning well means at an elevation below the upflow flter outlet and having a downflow filter outlet;

an amount of buoyant particulate filter media in the upflow filter vessel sufficient to form a buoyant filtration bed in the passageway;

an amount of nonbuoyant particulate filter media in the downflow filter vessel sufficient to form a nonbuoyant filtration bed therein extending above the downflow filter outlet;

cleaning means including a drain outlet communicating with the cleaning well means, drain means for selectively opening the drain outlet to drain the cleaning well means, buoyant filtration bed cleaning means for selectively supplying air and cleaning liquid upwardly through the buoyant filtration bed, nonbuoyant filtration bed cleaning means for selectively supplying cleaning liquid upwardly through the nonbuoyant filtration bed,

the drain means closing the drain outlet during water filtration such that water entering the upflow filter inlet passes through the buoyant filtration bed, the upflow filter outlet, the cleaning well means, the downflow filter inlet, the nonbuoyant filtration bed, and the downflow filter outlet,

the drain means opening the drain outlet at times when the buoyant filtration bed cleaning means is supplying cleaning liquid to the buoyant filtration bed so as to drain cleaning liquid and removed solids which pass from the buoyant filtration bed through the upflow filter outlet and into the cleaning well means as the buoyant filtration bed is cleaned,

the drain means also opening the drain outlet at times when the nonbuoyant filtration bed cleaning means is supplying cleaning liquid to the nonbuoyant filtration bed so as to drain cleaning liquid and removed solids which pass from the nonbuoyant filtration bed through the downflow filter inlet and into the cleaning well means as the nonbuoyant filtration bed is cleaned.

14. A method of filtration of water comprising:

positioning an amount of buoyant particulate filter media in an upflow filter vessel to form a buoyant filtration bed in the upflow filter vessel;

positioning an amount of nonbuoyant particulate filter media in a downflow filter vessel to form a nonbuoyant filtration bed in the downflow filter vessel

flowing water upwardly through the buoyant filtration bed;

after water has flowed upwardly through the buoyant filtration bed, flowing the water downwardly through the nonbuoyant filtration bed;

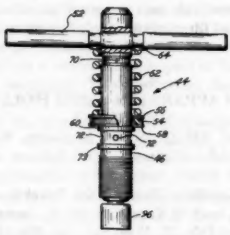
selectively disbursing gas bubbles into water at a location upstream of the buoyant filtration bed to cause at least some of the particles of the buoyant filtration bed to move and the buoyant filtration bed to expand and release solids trapped in such buoyant filtration bed during filtration; and

flowing buoyant filtration bed cleaning water upwardly through the upflow filter vessel while the bed is expanded to carry the separated solids away from the upflow filter vessel.

4,547,287
THERMOSTATICALLY CONTROLLED PACK HOLD-DOWN ASSEMBLY

John D. Gaither, West Salem, Ill., assignor to Champion Laboratories, Inc., West Salem, Ill.

Filed Mar. 7, 1984, Ser. No. 587,071
Int. Cl.⁴ B01D *27/10*
U.S. Cl. 210—149 **12 Claims**



1. A filter assembly comprising a housing, a liquid inlet in said housing, a liquid outlet in said housing and a filter pack in said housing, characterized by thermostatically controlled valve means in said housing responsive to the temperature of the liquid in the housing and which is opened for bypassing liquid about the filter pack when the liquid is cold and viscous and which is closed when the liquid is warmed and less viscous so that all liquid will pass through the filter pack, a pack hold-down stud in said housing, said valve means being disposed in said pack hold-down stud, and a thermally responsive actuator for said valve means in said pack hold-down stud.

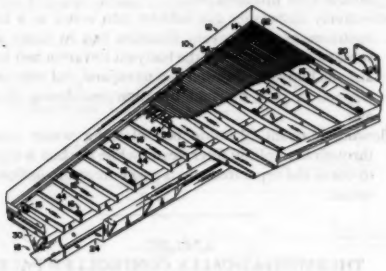
4,547,288
METALLIC PROFILE WIRE SCREEN FOR A FILTER SURFACE

David H. Little, Lakeland, Fla., assignor to Murray Industries, Tampa, Fla.

Continuation-in-part of Ser. No. 445,855, Dec. 1, 1982, abandoned. This application May 2, 1984, Ser. No. 606,148
Int. Cl.⁴ B01D *33/24*
U.S. Cl. 210—232 **3 Claims**

1. A filter cell with a profiled metallic wire filter surface for use with a tiltable pan type filter to filter slurry: said filter cell comprises a filter pan cooperatively formed by a pan bottom having a trough extending longitudinally therein and a pair of side members and a pair of end members, and a filter medium support to operatively support a filter medium, said filter medium comprising a plurality of elements held in fixed spaced

relationship relative to each other by a plurality of support rods wherein adjacent elements cooperatively form continuous slot openings therebetween and a plurality of adjustable filter medium anchors attached to said filter medium support to secure said filter medium thereto, each said adjustable filter medium anchor comprises a substantially horizontally positioned U-shaped bracket including means defining a pair of elongated apertures formed through opposite sides thereof



having an elongated slide bar extending between and through said pair of elongated apertures and a corresponding plurality of fastener plates affixed to said filter medium, said elongated slide bars and said corresponding plurality of fastener plates each including means defining corresponding apertures formed therein to receive a corresponding plurality of fasteners therethrough to attach said plurality of fastener plates to said corresponding elongated slide bars to permit lateral and longitudinal adjustment of said filter medium relative to said filter pan.

4,547,289

FILTRATION APPARATUS USING HOLLOW FIBER MEMBRANE

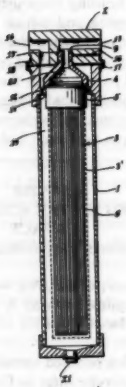
Yoshihiro Okano, 238-21 Okada, Mabi-cho, Kibi-gun, Japan (710-11); Takehiko Okamoto, 1660 Sakazu, and Akio Ohmory, 1497-25 Mizue, both of Kurashiki-city, Japan (710), assignors to Yoshihiro Okano, Kibi; Takehiko Okamoto and Akio Ohmory, both of Kurashiki, all of, Japan

Filed Feb. 27, 1984, Ser. No. 584,118

Claims priority, application Japan, Feb. 28, 1983, 58-33302; Sep. 24, 1983, 58-176811

Int. Cl.[4] B01D *31/00*

U.S. Cl. 210—652 **11 Claims**



11. A method for producing purified water free of bacteria and pyrogene, comprising the steps of:

feeding unpurified water under a pressure of between about 0.1 to 5 kg/cm^2 into the inlet of an inline filtration apparatus having membranes of hollow fibers incorporated therein for the removal of bacterias and pyrogenes; and

withdrawing purified water from the outlet of said in-line filtration apparatus, said filtration apparatus comprising:

a bundle of hollow fibers collected and fixed at one end thereof with a cast-molding material and closed at the other end thereof;

a cap member coupled to the collected and fixed end of said bundle;

at least two spaced seals installed about the circumference of said cap member;

a housing provided with an opening at the upper end thereof for receiving the bundle of hollow fibers therein,

a removable cover member for closing the upper end opening of said housing in a liquid-tight manner,

two openings in said cover member, one communicating with an inlet for liquid to be treated and the other communicating with an outlet for treated liquid,

means for mounting said cap member into one of said two openings, and

a leakage opening in said cover member between said seals for leading any liquid leaking across one of said seals to the outside of said apparatus.

4,547,290

PROCESS FOR SOLIDIFICATION OF STRONGLY ACIDIC OR AKALINE LIQUID WASTES

Philippe Pichat, 18 rue des Tournelles, 75004 Paris, France

Filed May 2, 1984, Ser. No. 606,991

Claims priority, application France, May 3, 1983, 83 07311

Int. Cl.[4] C04B *1/00*; C02F *11/14*

U.S. Cl. 210—751 **11 Claims**

1. A process for the solidification of very acidic liquid wastes having a pH of less than or equal to about 2 or strongly basic liquid wastes having a pH of greater than or equal to about 12, into stable non-poluting solids which are resistant to leaching by water, consisting essentially of the steps of:

mixing the very acidic or strongly basic waste liquid with a clay material; and then

solidifying the mixture by adding hydraulic and/or calcium binder.

4,547,291

METHOD FOR TREATING AQUEOUS SOLUTIONS WITH WEAKLY ACIDIC CATION EXCHANGE RESINS

Robert Kunin, Yardley, Pa., and Eli Salem, Deal, N.J., assignors to The Graver Company, Union, N.J.

Filed Dec. 12, 1983, Ser. No. 560,812

The portion of the term of this patent subsequent to Oct. 15, 2002, has been disclaimed.

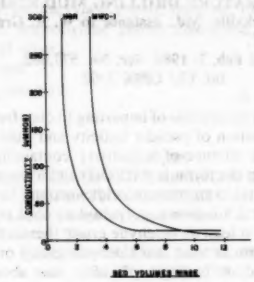
Int. Cl.[4] B01J *47/04*

U.S. Cl. 210—670 **35 Claims**

1. A method for selectively removing impurities including sodium ions from a liquid containing ammonia and sodium ions comprising the steps of:

(a) preparing a bed of filter materials including a cation exchange resin and an anion exchange resin, said cation exchange resin having a pK_a greater than about 5.8; and

(b) passing the liquid through the bed at a temperature less than 200° F. and at a flow rate of less than about 75 gallons



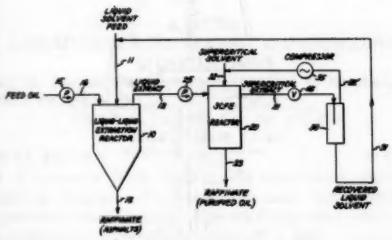
per minute per square foot to substantially remove the sodium ion impurities and purify the liquid.

4,547,292

SUPERCRITICAL FLUID EXTRACTION AND ENHANCEMENT FOR LIQUID LIQUID EXTRACTION PROCESSES

Andrew S. Zarchy, Amawalk, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 31, 1983, Ser. No. 547,274
Int. Cl.[4] B01D *11/04*
U.S. Cl. 210—634 **10 Claims**



1. A combined liquid-liquid and supercritical fluid extraction process comprising the steps of:

supplying a feed solution suitable for liquid-liquid solvent extraction to a liquid-liquid extraction reaction vessel, said feed solution containing solute to be removed;

supplying, to said liquid-liquid extraction reaction vessel, a liquid solvent capable of dissolving at least a portion of said solute in said feed solution, so as to form a first raffinate product and a first liquid extract product in said liquid-liquid extraction reaction vessel, said first liquid extract including at least a portion of said solute;

supplying said liquid extract from said liquid-liquid extraction reaction vessel to a supercritical fluid extraction reaction vessel; and

supplying a supercritical solvent to said supercritical fluid extraction reaction vessel so as to form a second raffinate and a supercritical extract.

4,547,293

PROCESS FOR REMOVAL OF AMMONIA AND ACID GASES FROM CONTAMINATED WATERS

C. Judson King, Kensington, and Patricia D. MacKenzie, Berkeley, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 414,544, Sep. 3, 1982, abandoned. This application Aug. 30, 1984, Ser. No. 645,657
Int. Cl.[4] B01D *19/00, 13/00*
U.S. Cl. 210—638 **8 Claims**

1. In a process for the removal of ammonia and weak acid gases from contaminated water wherein:

(a) said contaminated water is contacted with an ion exchange agent to combine said ion exchange agent with said ammonia; and,

(b) said acid gases are concurrently extripped from said contaminated water with a gaseous stripping media;

(c) the improvement comprising the prevention of the formation of an emulsion of said ion exchange agent with said water by employing the water-insoluble organophosphoric acid as said ion exchange agent and with the further provision that said organophosphoric acid is dissolved in a water-immiscible organic solvent whereby said organophosphoric acid ion exchange agent with said water-immiscible organic solvent forms an organic phase and said contaminated water forms a water phase.

4,547,294

ALKALINE SCALE ABATEMENT IN COOLING TOWERS

Richard W. Goeldner, Freeport, Fla., assignor to Mechanical Equipment Company, Inc., New Orleans, La.

Continuation-in-part of Ser. No. 350,004, Feb. 18, 1982, Pat. No. 4,444,675, which is a continuation-in-part of Ser. No. 283,939, Jul. 16, 1981, abandoned. This application Jan. 19, 1984, Ser. No. 572,227
The portion of the term of this patent subsequent to Apr. 24, 2001, has been disclaimed.
Int. Cl.[4] C02F *5/08*
U.S. Cl. 210—697 **10 Claims**

1. A method of reducing or substantially eliminating alkaline scale formation on cooling tower and heat transfer surfaces which are contacted by circulating water of a cooling tower, which water would normally contain a substantial concentration of carbonate and hydroxyl ions formed by decomposition of bicarbonate ions present in said water, said method comprising the steps of introducing in said circulating water:

(a) an effective amount of at least one chemical scale control additive which effects threshold alkaline scale inhibition in cooling tower water having a Langelier Saturation Index of up to +1.5; and,

(b) an amount of carbon dioxide sufficient to substantially reduce the decomposition of said bicarbonate ions to carbonate and hydroxyl ions in said water yet insufficient to result in excessive amounts of chemically uncombined carbon dioxide in said water, such that the pH of said water is maintained at about 7.5 or above as measured at room temperature, and the concentration of chemically uncombined carbon dioxide in said water is maintained at or below about 30 ppm, whereby corrosive conditions and alkaline scale formation are avoided.

4,547,295

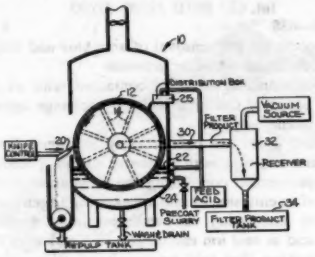
FILTRATION OF WET PROCESS SUPERPHOSPHORIC ACID

Jesse M. Carr, Jr.; Raymond E. Sheler, both of Washington; Frank J. Richards, Aurora, and Eric Kelder, Washington, all of N.C., assignors to Texasgulf Inc., Stamford, Conn.

Filed Dec. 7, 1983, Ser. No. 559,202
Int. Cl.[4] C01B *25/16*
U.S. Cl. 210—777 **15 Claims**

1. A method of filtering solid impurities from superphospho-

ric acid in a vacuum or pressurized filtration process wherein a filter aid is formed as a precoat on a filtration screen, said method providing enhanced filtration rates while achieving more efficient use of filter aid and improved product purity, said method comprising filtering superphosphoric acid through a filter aid formed by a heterogeneous mixture of particles having the following particle size characteristics:



from about 18% to about 30% by weight of the particles having a size greater than about 225 microns;

from about 12% to about 25% by weight of the particles having a size less than about 42 microns; and

the remainder of the particles being distributed throughout an intermediate range of particle size between about 42 microns to about 225 microns.

4,547,296

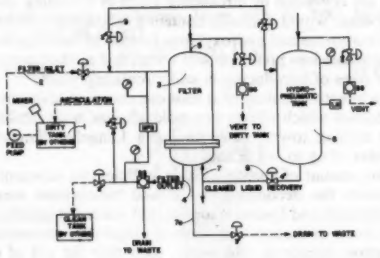
HEEL RECOVERY FILTRATION PROCESS AND APPARATUS

F. Thomas Sim, Stamford; Louis D. Ancillai, Milford, and Carson Leikam, Trumbull, all of Conn., assignors to Croll-Reynolds Engineering Co., Inc., Trumbull, Conn.

Filed Sep. 15, 1983, Ser. No. 532,493

Int. Cl.[4] B01D *29/38, 29/32*

U.S. Cl. 210—778 **5 Claims**



1. A process for removing suspended solids from a liquid without loss of heel portion comprising circulating a suspension of a precoat filter aid through a closed chamber provided with at least one vertical tubular, liquid pervious filter aid retainer supported on a tube sheet with the lower pervious section level with said tube sheet until a filter cake is formed on said retainer, pumping a liquid with suspended solids through the chamber whereby clear liquid passes through said filter cake into said retainer where clear liquid is recovered and suspended solids are deposited on filter cake, continuing pumping liquid with suspended solids until a maximum differential pressure is reached, reducing the pumping rate of liquid while simultaneously increasing air pressure to a maximum of 15 psig in the chamber, draining liquid from the chamber through the filter cake and retainer while maintaining air pressure of 2 to 15 psig to recover the heel portion, abruptly back washing liquid through the retainer and filter cake whereby the filter cake is destroyed and draining the mixture of filter cake and back wash liquid from the chamber.

4,547,297

HIGH TEMPERATURE DRILLING MUD STABILIZER

Jacob Block, Rockville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Feb. 7, 1984, Ser. No. 577,662

Int. Cl.[4] C09K *7/02*

U.S. Cl. 252—8.5 A **12 Claims**

1. In a composition capable of imparting to clay-free aqueous systems a combination of pseudoplasticity and fluid loss control comprising a mixture of a hydroxy containing alumina component having the formula AlO(OH) and a reaction product formed either (a) in an aqueous acidic medium having a pH of less than about 5.5 between polyvinyl alcohol and a compound containing at least an aldehyde group therein or capable of generating in situ at least one aldehyde group or (b) in an aqueous basic medium having a pH of at least about 9.5 between polyvinyl alcohol and an epihalohydrin,

the improvement wherein the mixture has added to it a high temperature stabilizing effective amount of a stabilizer which is a sodium or potassium salt of an anion selected from the group consisting of sulfate, tartrate, citrate and mixtures thereof, said salt being present in an amount such that when the composition is added to water to form an aqueous drilling fluid the salt is present in an amount of 0.5 to 10 wt.% based on the total weight of the aqueous drilling fluid.

4,547,298

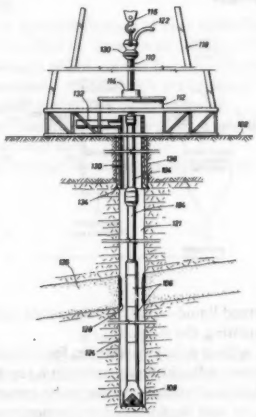
DRILLING MUD COMPOSITION WHICH MAY BE CONVERTED TO CEMENT UPON IRRADIATION

Lucille H. Novak, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Feb. 2, 1983, Ser. No. 462,838

Int. Cl.[4] C09K *7/02;* **E21B** *33/14*

U.S. Cl. 252—8.5 C **4 Claims**



1. A composition suitable for use as a drilling fluid in an oil or gas well and settable into a cementitious material upon radioactive irradiation comprising:

at least one polymeric material selected from the group consisting of: vinyl-, hydroxyl-, carboxy-terminated butadiene-acrylonitrile copolymers; polyethylene; polyacrylamide; polybutadiene; hydroxyl- or carboxyl-terminated polybutadiene; hydroxyl-terminated epichlorohydrin polymers; polybutadiene oxide; poly-vinyl alcohol; or butadiene-acrylonitrile-acrylic acid copolymer,

at least one monomeric cross-linking agent selected from the group consisting of: ethylene glycol diacrylate, tetra-ethy-

lene glycol diacrylate, neopentyl glycol diacrylate, tetrapropylene glycol diacrylate, trimethylolpropane triacrylate, ethylene glycol dimethacrylate, triethylene glycol dimethacrylate, tetraethylene glycol dimethacrylate, trimethylolpropane trimethacrylate, dicyclopentenyl oxyethyl methacrylate, divinyl benzene, 1,6-hexanediol diacrylate, tripropylene glycol diacrylate, diethyleneglycol divinyl ether,
water, and
at least one clay.

4,547,299

DRILLING FLUID CONTAINING A COPOLYMER FILTRATION CONTROL AGENT

James M. Lucas, Houston, Tex., assignor to Milchem Incorporated, Houston, Tex.

Filed Mar. 15, 1984, Ser. No. 590,029
Int. Cl.⁴ C09K *7/02*
U.S. Cl. 252—8.5 C **23 Claims**

1. In a method of drilling a well into a subterranean formation in which an aqueous drilling fluid containing clayey material is circulated into the well, the steps of forming a filter cake on the wall of the well to decrease loss of fluid from the drilling fluid, which comprises: (1) admixing with said drilling fluid an amount of at least about 0.5 weight percent of a copolymer of: (a) from between about 70 mole percent and about 100 mole percent of a (meth)acrylamido alkyl sulfonic acid or alkali metal salt thereof; and (b) from between about 30 mole percent and about 1 mole percent of N,N-dialkyl(meth)acrylamide, a 0.3 percent by weight aqueous solution of said copolymer having a viscosity at about 25° C. of from between about 18 centipoises and about 32 centipoises, as determined at a shear rate of 511 reciprocal seconds, the number of carbon atoms in the alkyl portion of the acrylamido-alkyl sulfonic acid or alkali metal salt thereof being about four, and the number of carbon atoms in the alkyl portion of the N,N-dialkyl(meth)acrylamide being from between about 1 and about 3.

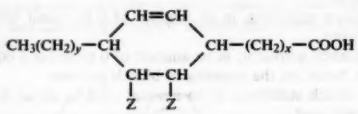
4,547,300

LIQUID DETERGENT FABRIC CONDITIONING COMPOSITIONS

Mary R. Lareau, Randolph, N.J., assignor to Beecham Inc., West Patterson, N.J.

Filed Nov. 21, 1984, Ser. No. 673,853
Int. Cl.⁴ D04B *13/46*
U.S. Cl. 252—8.8 **30 Claims**

1. A detergent fabric conditioning composition capable of imparting detergency, softness, anti-static and brightening properties to fabrics treated therewith during the wash cycle of a laundering process which comprises a fabric conditioning amount of a cationic fabric conditioning agent having fabric softening and anti-static properties, an effective amount of a non-ionic surfactant having detergent properties which is compatible with said cationic fabric conditioning agent, an optical brightening amount of a C_{21} dicarboxylic acid optical brightening agent of the formula:



a salt thereof or a mixture thereof wherein x and y are integers from 3 to 9, and x and y together = 12, one Z is hydrogen and the other Z is COOH or a salt thereof and an aqueous solvent system.

4,547,301

SURFACTANT COMPOSITIONS

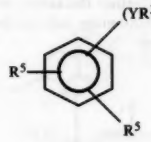
Julius Ooms, Langdorp, Belgium, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 2, 1984, Ser. No. 606,105
Claims priority, application United Kingdom, May 7, 1983, 8312619
Int. Cl.⁴ D06M *13/00*
U.S. Cl. 252—8.8 **17 Claims**

1. A surfactant composition for use in detergency or textile treatment comprising:

(a) from about 10% to about 90% of cationic surfactant having an endotherm melting completion temperature greater than about 20° C. and selected from the group consisting of di-C_{12}–C_{24} alkyl and alkenyl amine, ammonium and quaternary ammonium surfactants, mono-C_{12}–C_{24} alkyl and alkenyl amine and ammonium surfactants, mono- and di-C_{12}–C_{24} alkyl and alkenyl imidazolinium surfactants and mixtures thereof,

(b) from about 5% to about 40% of an aromatic adjunct selected from compounds having the formula



wherein X is CO_2R^4, SO_3R^4, or $(CO)R^4$, Y is O,NH or a direct bond, R^3 is C_{1-2} alkylene or alkenylene, p is from 0 to 4, R^4 is H or C_{1-12} alkyl, alkenyl, aryl or alkaryl, and wherein each R^5 is independently selected from $(YR^3)_pX$, C_{1-18} alkyl, alkenyl, aryl or alkaryl, halo, amino and C_{1-4} alkyl substituted amino groups,

(c) from 0% to about 85% of water-miscible non-aromatic organic solvent,

(d) from 0% to about 45% of substantially water-insoluble non-aromatic, nonionic extender, and

(e) from 0% to about 45% of auxiliary cationic surfactant having an endotherm melting completion temperature of less than about 20° C.,

wherein the cationic surfactant, aromatic adjunct, organic solvent, nonionic extender and auxiliary cationic surfactant, if present, constitute in total at least about 70% of the composition.

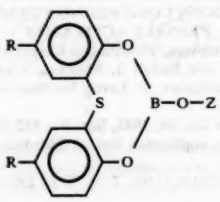
4,547,302

BORATE ESTERS AND LUBRICANT COMPOSITIONS CONTAINING SUCH ESTERS

Milton Braid, deceased, late of Haddonfield, N.J. (by Gerassimos Frangatos, executor), assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 31, 1983, Ser. No. 528,011
Int. Cl.⁴ C10M *1/30*
U.S. Cl. 252—48.4 **37 Claims**

1. A compound having the following general structure



where Z=2,6-di-t-butylphenol and where R is H or C_1 to C_{36} alkyl.

4,547,303

WATER-BASED FUNCTIONAL FLUIDS THICKENED BY THE INTERACTION OF AN ASSOCIATIVE POLYETHER THICKENER AND CERTAIN QUATERNARY AMMONIUM SALTS

Charles F. Deck, Trenton, and James E. Carson, Lincoln Park, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 1, 1984, Ser. No. 667,149

Int. Cl.⁴ C10M *1/32*

U.S. Cl. 252—73 **6 Claims**

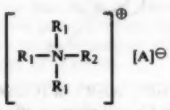
1. A functional fluid comprising

(a) from about 60.0 percent by weight to about 99.0 percent by weight of water, a freezing point additive or both;

(b) from about 1.0 percent by weight to about 25.0 percent by weight of a thickener component comprising

(i) an associative polyether thickener, and

(ii) a quaternary ammonium salt having the following chemical structure:



wherein R_1 is individually an alkyl radical having 1 to 4 carbon atoms, R_2 is an alkyl radical having 10 to 20 carbon atoms, and A is an anion which will form a salt with the ammonium cation;

such that the weight ratio of (i) to (ii) is from about 1:10 to about 10:1.

4,547,304

NONFUMING SOLDER CLEANSING AND FUSING FLUIDS

Edward E. McEntire, Austin; Gordon H. Neville, Rosenberg, and Edward C. Y. Nieh, Austin, all of Tex., assignors to Texaco, Inc., White Plains, N.Y.

Filed Aug. 30, 1984, Ser. No. 645,589

Int. Cl.⁴ C09K *13/00*; C03C *23/00*

U.S. Cl. 252—79.1 **8 Claims**

1. A composition comprising a solder fusing fluid having incorporated therein a cleansing amount of a thermally stable primary amine or ethoxylate of a primary amine.

4,547,305

LOW TEMPERATURE BLEACHING DETERGENT COMPOSITIONS COMPRISING PERACIDS AND PERSALT ACTIVATOR

Johannes M. Cornelissen, Vlaardingen; Cornelis A. Lagerwaard, Hellevoetsluis, and Rudolf J. Martens, Vlaardingen, all of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

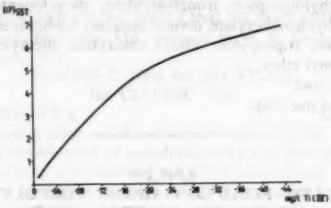
Filed Jul. 14, 1983, Ser. No. 513,555

Claims priority, application United Kingdom, Jul. 22, 1982, 8221230

Int. Cl.⁴ C11D *3/395, 7/18, 7/54*; D06L *3/00*

U.S. Cl. 252—94 **13 Claims**

1. Low temperature bleaching detergent compositions comprising about 3–30% by weight of a silicate, 2–35% by weight of an inorganic per-salt, 0.25 to 20% by weight of an organic



peracid precursor and less than 10 mg/kg of reactive titanium (IV), based on the total weight of the composition.

4,547,306

FABRIC DETERGENT COMPOSITIONS CONTAINING ACYLCYANAMIDES

Christian Hase, Erkrath; Martin Bischoff, Gelsenkirchen; Edmund Schmadel, Leichlingen, and Günther Vogt, Toenisvorst, all of Fed. Rep. of Germany, assignors to Henkel KGaA, Duesseldorf, Fed. Rep. of Germany

Filed Jun. 8, 1984, Ser. No. 618,608

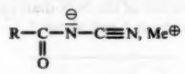
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1983, 3320726

Int. Cl.⁴ C11D *3/32, 7/18*

U.S. Cl. 252—99 **19 Claims**

1. A detergent composition for fabrics consisting essentially of:

(a) at least one acylcyanamide salt anionic surfactant present in about 1–30% by weight, having the formula



in which Me is sodium or potassium and R is a C_{9-23} alkyl or alkenyl, unsubstituted or substituted by at least one hydroxyl or alkoxyl group;

(b) a builder which is at least one condensed phosphate, or phosphate substitute comprising an inorganic or organic compound having a builder effect at least partly equivalent to that of sodium tripolyphosphate, present in an amount sufficient to balance the composition to 100% by weight;

(c) a non-acylcyanamide anionic surfactant, in an amount of 0 to about 30% by weight, which is alkylbenzene sulfonate, alpha-sulfofatty acid esters, alkane sulfonate, olefin sulfonate, alcohol sulfate, alkyl polyglycol ether sulfate, or any mixture thereof;

(d) a nonionic surfactant, in an amount of 0 to about 30% by weight, which is an alcohol ethoxylate, alkyl phenol ethoxylate, or any mixture thereof;

(e) a peroxide bleach, in an amount of 0 to about 40% by weight;

(f) a foam regulator, in an amount of 0 to about 20% by weight;

(g) a bleach activator, in an amount of 0 to about 1 equivalent, based on the quantity of bleach present;

(h) a bleach stabilizer, in an amount of 0 to about 5% by weight; and

(i) at least one auxiliary ingredient which is an enzyme, perfume oil, electrolyte, microbicide, or optical brightener, in an amount of 0 to a small percentage in addition to 100% of the detergent composition as defined by the foregoing ingredients.

4,547,307

CAKE OF SOAP WITH DEODORIZING ACTION

Udo Hoppe, Lottbeker Weg 7, 2000 Hamburg 65; Klaus-Peter Wittern, Wurmkamp 19, 2000 Hamburg-Schenefeld; Gerhard Sauermann, Hambrook 4, 2351 Wiemersdorf; Otto Stelling, Grandweg 12, 2000 Hamburg 54, and Manfred Rockl, Elbstrabe 5, 2000 Wedel/Holstein, all of Fed. Rep. of Germany

Filed Sep. 16, 1982, Ser. No. 418,814

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1981, 3137017

Int. Cl.[4] C11D *3/48, 9/50*

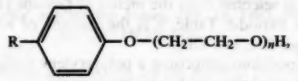
U.S. Cl. 252—107 5 Claims

1. A deodorizing cake of soap comprising

(a) 100 parts by weight of a base soap,

(b) 0.1 to 1 part by weight of 3,4,4'-trichlorocarbanilide,

(c) 1 to 4 parts by weight of an alkyl phenol polyglycol ether of the general formula



wherein R is an alkyl radical having 6 to 12 carbon atoms and n is 10 to 16, and

(d) 0.05 to 1 part by weight of wool wax alcohols.

4,547,308

AQUEOUS EMULSION OF TERTIARY BUTYL HYDROPEROXIDE

Reinder Torenbeek, Le Twello, Netherlands, assignor to Akzo N.V., Arnhem, Netherlands

Filed Nov. 28, 1983, Ser. No. 555,809

Claims priority, application Netherlands, Dec. 3, 1982, 8204690

Int. Cl.[4] B01F *17/22;* C08F *4/34;* C01B *15/00*

U.S. Cl. 252—186.26 6 Claims

1. A stable aqueous emulsion of tertiary butyl hydroperoxide comprising 20 to 70% by weight of said tertiary butyl hydroperoxide and 0.1 to 10% by weight of hydroxyethyl cellulose having a degree of molar substitution greater than 2.0.

4,547,309

STORAGE-TYPE LIQUID CRYSTAL COMPOSITION

Akihiro Mochizuki, Atsugi; Kasumi Ikegami, Sagamihara; Toshiaki Narusawa, Sagamihara, and Hirofumi Okuyama, Sagamihara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 6, 1983, Ser. No. 558,475

Claims priority, application Japan, Dec. 24, 1982, 57-225826

Int. Cl.[4] G02F *1/13;* C09K *3/34*

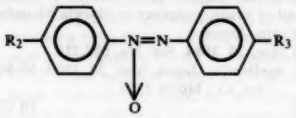
U.S. Cl. 252—299.63 15 Claims

1. A storage-type liquid crystal composition in which a nematic-cholesteric mixture liquid crystal exhibiting a positive anisotropy of the dielectric constant is used, said composition comprising a cyclohexane-type liquid crystal of formula I, at least one azoxy type liquid crystal of formula IIa and IIb, and a compensated cholesteric liquid crystal of cholesteryl myristrate and chlosteryl chloride of formulae IIIa and IIIb, respectively:

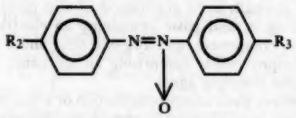
(I)

where R_1 represents a straight-chain alkyl or alkoxy group having one to seven carbon atoms,

(IIa)

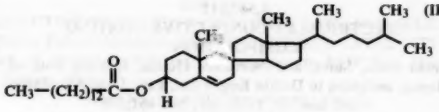


(IIb)

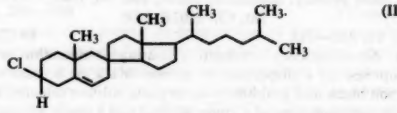


where R_2 represents an alkyl or alkoxy group having one to seven carbon atoms and R_3 represents a straight-chain alkyl or alkoxy having one to seven carbon atoms or a cyano group,

(IIIa)

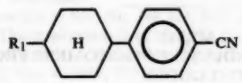


(IIIb)



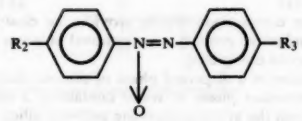
9. A storage-type liquid crystal composition in which a nematic-cholesteric mixture liquid crystal exhibiting a positive anisotropy of the dielectric constant is used, said composition comprising a cyclohexane-type liquid crystal of formula I, at least one azoxy type liquid crystal of formulas IIa and IIb, and a cholesteryl oleate of Formula III:

(I)

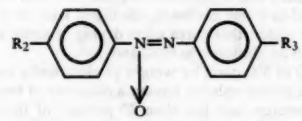


where R_1 represents a straight-chain alkyl or alkoxy group having one to seven carbon atoms,

(IIa)



(IIb)



where R_2 represents an alkyl or alkoxy group having one to seven carbon atoms and R_3 represents a straight-chain alkyl or alkoxy having one to seven carbon atoms or a cyano group,

$$CH_3(CH_2)_7CH{=}CH(CH_2)_7COOC_{27}H_{45} \quad \text{(III).}$$

4,547,310

CARBON RESISTIVE PASTE

Tohru Kasanami; Hirozi Tani, both of Kyoto, and Tsutomu Yokoi, Osaka, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Mar. 23, 1984, Ser. No. 592,716
Claims priority, application Japan, Mar. 30, 1983, 58-56267
Int. Cl.[4] H01B 1/06
U.S. Cl. 252—511 **10 Claims**

1. In a carbon resistive paste for producing a carbon resistive film of high film strength upon application of said paste to a substrate and baking it, said paste containing an electrically conductive carbon component, an inorganic filler and a resin component, the improvement comprising an inorganic filler treated with a silane coupling agent.

2. A carbon resistive paste comprising carbon or a mixture of carbon and graphite as an electrically conductive component, a resin component, a solvent and an inorganic filler treated with a silane coupling agent wherein a resistive film of high film strength is obtained upon application of said paste to a substrate and baking it.

4,547,311

ELECTRICALLY CONDUCTIVE COATING COMPOSITION

Junichi Sako, Suita, and Norimasa Honda, Ibaraki, both of Japan, assignors to Daikin Kogyo Co., Ltd., Osaka-fu, Japan

Filed Jan. 27, 1983, Ser. No. 461,598
Claims priority, application Japan, Jan. 30, 1982, 57-13960
Int. Cl.[4] H01B 1/06
U.S. Cl. 252—511 **10 Claims**

1. An electrically conductive coating composition which comprises (a) a dispersion of carbon black or a mixture of carbon black and graphite in an organic solvent selected from the group consisting of a lower alcohol and a lower ketone and (b) a solution of a polymer selected from the group consisting of fluoroelastomers, urethane elastomers and vinylidene fluoride/tetrafluoroethylene copolymers in an organic solvent, the weight ratio of carbon black or the mixture of carbon black and graphite to the polymer being from 0.1:1 to 1.5:1 the viscosity of the composition being higher than those of the dispersion (a) and the solution (b), the viscosity of the dispersion (a) being from 100 to 5,000 cp, and the viscosity of the solution (b) being from 1,000 to 5,000 cp.

4,547,312

ELECTRICALLY CONDUCTIVE ELASTOMERS FROM EMULSIONS

Daniel Graiver, Midland, and Robert E. Kalinowski, Auburn, both of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Aug. 31, 1984, Ser. No. 645,985
Int. Cl.[4] H01B 1/06
U.S. Cl. 252—513 **21 Claims**

1. A silicone composition which provides an elastomeric electrically conductive product upon removal of water under ambient conditions comprising

(A) an emulsion of a dispersed phase of silicone elastomer, and a continuous phase of water containing a material selected from the group comprising colloidal silica, alkali metal silicates, and organosilicates, said emulsion being an aqueous oil-in-water emulsion, having at least 20 percent by weight water, that cures upon drying at ambient temperature to an elastomeric film, and

(B) from 100 to 500 parts by weight of electrically conductive, metal coated spheres having a diameter of from 5 to 105 micrometers and less than 20 percent of their total weight as metal, said metal being selected from the group consisting of gold, silver, platinum, palladium, and nickel, based upon 100 parts by weight of non-volatile material in (A),

the composition, upon removal of the water, yielding an elastomeric product having dispersed particles of elastomer and electrically conductive spheres in a solid polar continuous phase, and having a surface resistivity of less than 2 ohms per square on at least one surface.

4,547,313

CONDUCTIVE POLYMER COMPOSITION

Van C. Vives, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 18, 1983, Ser. No. 485,806
Int. Cl.[4] H01B 1/06
U.S. Cl. 252—518 **19 Claims**

1. A composition comprising a poly(arylene sulfide) and from about 3 weight percent to about 12 weight percent, based on the weight of the composition, of a solid represented by the formula

$$[CF_3—(R)_{0-2}—SO_3]_xM$$

wherein M is selected from the metals of Groups IB, IIB and VIII of the Periodic Table, x is the valence of M and R is selected from CH_2 and CF_2.

6. A composition comprising a poly(arylene sulfide) and an amount of a solid represented by the formula

$$[CF_3—(R)_{0-2}—SO_3]_xM$$

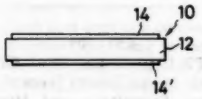
effective for increasing the electrical conductivity of the poly(arylene sulfide), wherein M is selected from the metals of Groups IB, IIB and VIII of the Periodic Table, x is the valence of M and R is selected from CH_2 and CF_2.

4,547,314

SEMICONDUCTIVE CERAMIC MATERIALS WITH A VOLTAGE-DEPENDENT NONLINEAR RESISTANCE

Masaru Masuyama, Harunamachi; Susumu Hirooka, Takasaki, and Nobutatsu Yamaoka, Harunamachi, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1983, Ser. No. 507,550
Claims priority, application Japan, Aug. 24, 1982, 57-146343
Int. Cl.[4] H01B 1/06
U.S. Cl. 252—520 **2 Claims**



1. A semiconductive ceramic material with a voltage-dependent nonlinear resistance, comprising:

(a) 100 mole parts of $SrTiO_3$;

(b) from about 0.01 to about 3.00 mole parts of at least one metal oxide selected from the group consisting of Nb_2O_5, Ta_2O_5, WO_3, La_2O_3, CeO_2, Nd_2O_3, Y_2O_3, Pr_6O_{11}, Sm_2O_3, Eu_2O_3, and Dy_2O_3;

(c) from about 0.02 to about 2.50 mole parts of Na_2O; and

(d) from about 0.01 to about 1.50 mole parts of Al_2O_3.

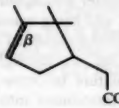
4,547,315

ALKYL ALPHA-CAMPHOLENATES AND DIHYDRO DERIVATIVES THEREOF AS ODORANTS AND FLAVORANTS

Martin Rohr, Glen Rock, and Cormack Flynn, Ramsey, both of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Filed Jan. 26, 1983, Ser. No. 461,079
Int. Cl.[4] A61K 7/46; C11B 9/00
U.S. Cl. 252—522 R **8 Claims**

1. A fragrance composition comprising an olfactorily effective amount of a compound of the formula



I

wherein:

R represents methyl, ethyl, propyl or butyl, and the dotted line designated by β is an optional bond, and at least one other olfactory agent.

4,547,316

INSULATING GAS FOR ELECTRIC DEVICE

Shiro Yamauchi, Nishinomiya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1984, Ser. No. 618,824

Claims priority, application Japan, Jun. 16, 1983, 58-109600

Int. Cl.⁴ H01B *3/56*

U.S. Cl. 252—571 **4 Claims**

1. An insulating gas mixture for an electric device, which comprises pentafluoropropionitrile and at least one nitrite ester selected from methyl nitrite, ethyl nitrite, propyl nitrite, butyl nitrite, and amyl nitrite.

4,547,317

POLY(ETHYLENEOXY)-SUBSTITUTED-9,10-BIS(-PHENYLETHYNYL)ANTHRACENE MIXTURES

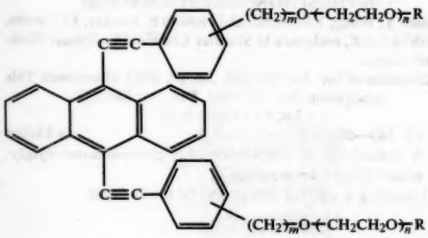
Victor M. Kamhi, Skillman, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 436,210, Oct. 25, 1982,. This application Mar. 12, 1984, Ser. No. 588,265

Int. Cl.⁴ C09K *11/06*

U.S. Cl. 252—700 **5 Claims**

1. A chemiluminescent reaction mixture comprising a compound defined by the structural formula



(I)

wherein m is an integer from 1 to 5, n is an integer from 1 to 20 and R represents hydrogen or C_1 to C_5 alkyl, as a fluorescer component in said mixture.

4,547,318

PREPARATION OF COLOR-STABLE, LIGHT-COLORED, AQUEOUS SALT PASTES OF WASH-ACTIVE, α-SULFOFATTY ACID ESTERS

Dietrich Kloetzer, Duesseldorf; Karl-Heinz Linde, Langenfeld, and Klaus Ojust, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel KgaA, Duesseldorf, Fed. Rep. of Germany

Filed Apr. 26, 1984, Ser. No. 604,100

Claims priority, application Fed. Rep. of Germany, May 30, 1983, 3319591

Int. Cl.⁴ C07C *143/90*

U.S. Cl. 260—400 **16 Claims**

1. A process for the preparation of color-stable, light-colored aqueous salt pastes of wash-active esters of α-sulfofatty acids with C_1–C_8-alkanols consisting essentially of the steps of

(1) subjecting a dark-colored, wash-active α-sulfofatty acid ester with C_1–C_8-alkanols in the form of an alkali-metal salt paste containing from 20% to 60% by weight of said ester at a pH-value in the range of 7 to 11 and a temperature of from 50° to 75° C. to the action of from 0.1 to 4% by weight of an alkali metal hypochlorite based on wash-active substance (WAS) for a time sufficient to effect substantial bleaching,

(2) removing the hypochlorite excess by lowering the pH-value to the range of from about 4.0 to 6.5 or by the addition of a reducing agent, of both,

(3) subjecting the partially bleached paste to the action of from about 1 to 2.5% by weight of hydrogen peroxide, expressed as 100% H_2O_2 and based on WAS, at a pH-value in the range of about 4.0 to 6.5 and a temperature of from 50° to 75° C. for a time sufficient to effect further bleaching, and

(4) recovering a color-stable, light-colored aqueous salt paste of wash-active esters of α-sulfofatty acids with C_1–C_8-alkanols.

4,547,319

SELECTIVE REDUCTION OF EDIBLE FATS AND OILS USING PHOSPHORUS-MODIFIED NICKEL CATALYSTS

Gail M. Qualeatti, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 13, 1983, Ser. No. 541,644

Int. Cl.⁴ C11C *3/12*

U.S. Cl. 260—409 **8 Claims**

1. A method of selective hydrogenation of fatty materials comprising contacting a fatty material with a supported, phosphide-containing zerovalent nickel catalyst having from about 0.4 to about 15 wt. % phosphorus relative to nickel at a temperature from about 125° to about 275° C. in the presence of hydrogen at a pressure up to about 150 psi, and recovering the resulting product.

4,547,320

TIN COMPOUNDS

Eric J. Bulten, Blaricum, and Hendrik A. Budding, Driebergen, both of Netherlands, assignors to Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek, Netherlands

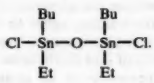
Continuation of Ser. No. 268,232, May 29, 1981, abandoned. This application Sep. 13, 1982, Ser. No. 417,091

Claims priority, application Netherlands, May 30, 1980, 8003160; May 8, 1981, 8102269

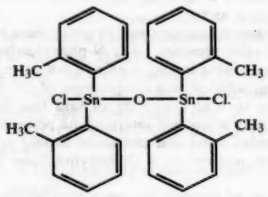
Int. Cl.⁴ C07F *7/22*

U.S. Cl. 556—83 **7 Claims**

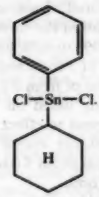
1. A tin compound having the formula:



3. A tin compound having the formula:



5. A tin compound having the formula:



4,547,321

COMPOUNDS CONTAINING THE $[CO(MOS_4)_2]^{3-}$ TRIANION AND THEIR PREPARATION

Edward I. Stiefel, Bridgewater; Wie-Hin Pan, Fanwood, both of N.J., and Stephen McKenna, Oakland, Calif., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

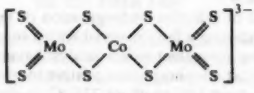
Filed Jul. 29, 1983, Ser. No. 518,362

Claims priority, application United Kingdom, Apr. 29, 1983, 8311906

Int. Cl.[4] C07F *11/00, 15/06*

U.S. Cl. 556—14 15 Claims

1. The composition of matter containing the $[Co(MoS_4)_2]^{3-}$ trianion of the structure



and one or more cations with a charge sufficient to balance the trinegative charge of said trianion.

4,547,322

METHOD FOR MANUFACTURE OF DIPHENYLMETHANE DIISOCYANATES

Shinsuke Fukuoka; Masazumi Chono; Tomonari Watanabe, all of Okayama, and Masashi Kohno, Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

Filed Mar. 19, 1984, Ser. No. 590,671

Claims priority, application Japan, Mar. 18, 1983, 58-45761

Int. Cl.[4] C07C *118/00*

U.S. Cl. 260—453 P 25 Claims

1. A method for the manufacture of a diphenylmethane diisocyanate from a N-phenylcarbamate comprising:

(A) a process of methylenation for the formation of a condensation product containing at least 80 mol % of a dinuclear diphenylmethane dicarbamate by the steps of

(1) causing a methylenating agent to react upon at least 2 moles of a N-phenylcarbamate, based on 1 mole of the methylene group of said methylenating agent, in a liquid phase in the presence of an aqueous inorganic acid solution,

(2) separating the resultant reaction mixture into the aqueous inorganic acid solution and an organic phase reaction mixture containing substantially none of said inorganic acid, and

(3) subsequently treating said organic phase reaction mixture in the presence of a N-phenylcarbamate and a carboxylic acid having a pKa of not more than 4 in an aqueous solution at a temperature of 25° C. of a solid acid or an acid consisting of said two acids thereby converting a reaction intermediate possessing a methylene-amino bond and contained in said organic phase reaction mixture to a diphenylmethane dicarbamate, and

(B) a process of thermal decomposition by the steps of allowing a mixture comprising 1 to 50% by weight of the condensation product obtained in said process of (A) and 99 to 50% by weight of a thermal decomposition solvent having a boiling point under atmospheric pressure in the range of 120° to 350° C. and being inactive to isocyanates to flow down into a reactor maintained at temperatures in the range of 180° to 380° C. through the upper part thereof, causing said mixture to come into counterflow contact with a carrier introduced into said reactor upwardly via the lower part thereof thereby producing an organic hydroxyl compound, allowing said organic hydroxyl compound to be discharged from said reactor in the form of vapor in conjunction with said carrier through the upper part thereof, and withdrawing the resultant isocyanate solution from said reactor through the lower part thereof.

4,547,323

SYNTHESIS OF 2,2-DIMETHYL-4-METHYLENEGLUTARIC ACID AND DERIVATIVES

Gary M. Carlson, North Olmsted, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Mar. 21, 1984, Ser. No. 591,803

Int. Cl.[4] C07C *120/00, 121/00, 69/593, 67/465, 51/353, 57/13*

U.S. Cl. 260—465.4 18 Claims

1. A process for producing a low molecular weight 2,2-dimethyl-4-methyleneglutaric acid derivative, comprising: dimerizing a methacrylate monomer in the presence of a free radical initiator and in the presence of between 0.001% and 0.1% Cobalt(II) complex catalyst for chain transfer to monomer based on the weight of said monomer to produce a product comprising a 2,2-dimethyl-4-methyleneglutaric acid derivative, wherein said catalyst is a Cobalt(II) dioxime or Cobalt(II) porphyrin catalyst.

10. The process in claim 1 where the methacrylate comprises 2-isocyanatoethyl methacrylate.

4,547,324

METHOD FOR PREPARATION OF N-PHOSPHONOMETHYLGLYCINE

Rayman Y. Wong, Richmond, and Nathan S. Bunker, El Cerrito, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

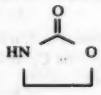
Continuation of Ser. No. 403,238, Jul. 29, 1982, abandoned. This application Jul. 27, 1984, Ser. No. 635,033

Int. Cl.[4] C07F *9/38*

U.S. Cl. 260—502.4 R 4 Claims

1. A method for the preparation of N-phosphonomethylglycine which comprises the steps of

(1) reacting a starting compound of the formula



with p-formaldehyde, then adding a substituted phosphorus compound of the formula PXYZ wherein X is halogen, and Y and Z are independently selected from the group consisting of halogen, alkoxy having from 1–10 carbon atoms and aryloxy, said reaction being conducted in the presence of a low molecular weight carboxylic acid solvent for the reactants, at a combination of time and temperature sufficient to cause the formation of an intermediate 2-oxo-3-oxazolidinyl methyl phosphonic acid,

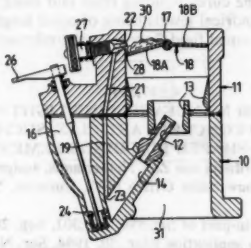
(2) reacting said 2-oxo-3-oxazolidinylmethyl phosphonic acid with an alkali or alkaline earth hydroxide, and cadmium oxide catalyst in water, and

(3) subsequently acidifying the reactants with an acid to form the end product N-phosphonomethylglycine.

4,547,325
CARBURETOR FOR INTERNAL COMBUSTION ENGINES

Charles B. Shivers, Jr., 816 S. 82nd St., Birmingham, Ala. 35206

Filed Jul. 2, 1984, Ser. No. 627,059
Int. Cl.[4] F02M *3/08*
U.S. Cl. 261—65 1 Claim



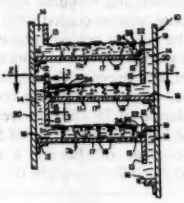
1. In a carburetor of the kind having a passage in which fuel is mixed with in coming air and further provided with an idle jet communicating with the passage through a wall defining the passage and a main jet, the improvment comprising,

a throttle valve mounted on a shaft for controlling the flow of the fuel air mixture through said passage, said valve having the portion thereof adjacent the idle jet bent upstream of the opposite portion, with said opposite portion being perpendicular to the longitidinal axis of said passage in its closed position, and with said bent portion positioned upstream of said idle jet and in spaced relation with said passage wall in an idle position.

4,547,326
GAS LIQUID CONTACTING TRAY

David W. Weiler, Burt, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 238,803, Feb. 27, 1981,. This application Dec. 17, 1984, Ser. No. 682,185
Int. Cl.[4] B01F *3/04*
U.S. Cl. 261—114 R 19 Claims



1. In a gas-liquid contacting tray for use in a gas-liquid contacting tower for effecting intimate contact between rising gas and liquid flowing along a path on the surface of said tray across a gas-liquid contacting member of said tray from a liquid inlet region to a liquid discharge region;

said tray having a wall member continuously associated with the extending the width of said discharge region oriented transverse to said path of liquid flow;

said wall member extending substantially vertically upwardly from said discharge region terminating in an upper edge thereby providing a frontal area facing said path of fluid flow for restricting discharge of said flowing liquid from said tray;

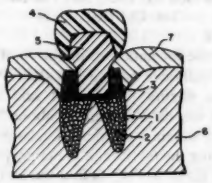
the improvement which consists essentially of:

said wall member having an aperture positioned below said wall member upper edge at a location to be completely submerged below the surface of said flowing liquid over at least a major portion of the flow conditions of said contacting tray for discharging said flowing liquid, said wall member having no aperture(s) positioned at said upper edge and no aperture(s) positioned at a location such as not to be completely submerged below the surface of said flowing liquid over at least a major portion of the flow conditions of said contacting tray for discharging and flowing liquid.

4,547,327
METHOD FOR PRODUCING A POROUS PROSTHESIS

Paul F. Bruins, Brooklyn, and Arthur Ashman, New York, both of N.Y., assignors to Medical Biological Sciences, Inc., New York, N.Y.

Continuation of Ser. No. 214,572, Dec. 8, 1980, abandoned. This application Aug. 8, 1984, Ser. No. 638,807
Int. Cl.[4] A61C *13/00, 13/08*
U.S. Cl. 264—16 19 Claims



1. A process for producing a porous implantable oral prosthesis comprising the steps of:

(a) filling a portion of a mold cavity of the desired shape with relatively coarse polymeric particles coated with a hydrophilic monomer where said prosthesis is intended to interface with bone tissue;

(b) filling the remainder of said mold cavity with relatively fine polymeric particles coated with a hydrophilic monomer where said prosthesis is intended to interface with soft tissue;

(c) sintering the polymeric particles and polymerizing the hydrophilic monomer in the mold by the application of heat to form the prosthesis;

(d) allowing the mold to cool;

(e) removing the sintered prosthesis from the mold; and

(f) placing the prosthesis in a hot liquid to remove toxic residues.

4,547,328
METHOD FOR PRODUCING FOAMED PLASTIC INSULATOR

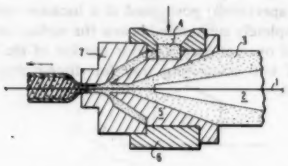
Masao Yuto, and Yoichi Suzuki, both of Yokohama, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Division of Ser. No. 335,318, Dec. 29, 1981, which is a continuation of Ser. No. 970,021, Dec. 14, 1979, abandoned. This application Apr. 16, 1984, Ser. No. 600,870
Claims priority, application Japan, Dec. 16, 1977, 52-150600
Int. Cl.[4] B29D *27/00;* B29F *3/10*
U.S. Cl. 264—45.9 7 Claims

1. A method for producing a foamed plastic insulator comprising the steps of:

preparing a plastic material comprising low density polyethylene having a melt flow swelling ratio of at least 55%

adding a chemical and/or inert gas blowing agent to said plastic material,



extruding a mixture of said plastic material and said blowing agent over a conductor, and

foaming said mixture to produce foamed insulation layer.

4,547,329

PROCESS FOR FORMING COPOLYMER PARTICLES

John R. Dombroski; J. Maynard Hawkins, both of Kingsport; Mark A. Pollock, Johnson City; Alan P. Leonard, and Thomas A. Mitchell, both of Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 31, 1983, Ser. No. 547,309

Int. Cl.[4] D01F *6/14*

U.S. Cl. 264—118 **6 Claims**

1. Process for the formation of olefin-vinyl alcohol copolymer pellets, said polymer having less than 3% vinyl acetate, which comprises mixing particles of said copolymer with water to obtain a wet cake containing about 20–70% solids by weight to thereby obtain a plasticized mass of the copolymer, thereafter extruding the mixture of the copolymer and water at a temperature of about 5–7° C. below the melting point of the mass through a nozzle to form a rod, and dividing the rod into individual pellets.

4,547,330

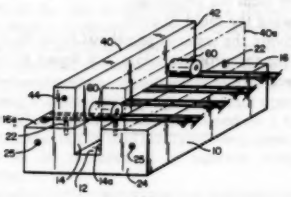
METHOD OF PREPARING AN ORIFICE PLATE FOR AN INK JET PRINTER

William J. Daughton, Colorado Springs, Colo., assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 25, 1984, Ser. No. 573,740

Int. Cl.[4] B29H *9/00*

U.S. Cl. 264—261 **2 Claims**



1. A method for preparing an orifice plate for ink jet printing apparatus which comprises:

(a) mounting pairs of closely spaced thin wires transversely across a cavity of square or rectangular cross-section in a mold;

(b) positioning said pairs of wires in parallel alignment with the midpoints of said pairs being equidistant from each other;

(c) tensioning said pairs of wires so that they will support a cylindrical jewel without deflection;

(d) positioning a first backing rectangularly shaped plate on said mold transversely to said pairs of wires;

(e) positioning on orifice cylindrical jewel on each of said pairs of wires so that one of its faces is in touching contact with said first backing plate;

(f) positioning a second rectangularly shaped backing plate on said mold transversely to said pairs of wires so that it is in touching contact with the second face of each of said cylindrical jewels;

(g) filling said mold with a liquid resin to completely cover said pairs of wires and cylindrical jewels;

(h) curing said liquid resin to a solid state; and

(i) removing the cured molding from said mold;

said orificed cylindrical jewels being of equal length and having substantially equal fluid flow rates therethrough.

4,547,331

METHOD FOR MANUFACTURING LIGHT-WEIGHT SHAPED CONCRETE ARTICLES, SUCH AS BLOCK-SHAPED BUILDING ELEMENTS

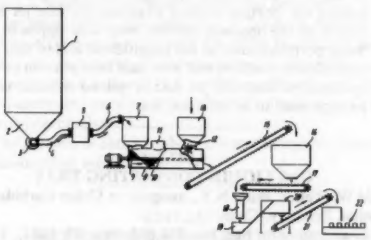
Ype Batstra, Noordwijk aan Zee, Netherlands, assignor to International Osobouw Sales Office N.V., Curacao, Netherlands Antilles

Continuation-in-part of Ser. No. 425,301, Sep. 28, 1982, abandoned. This application Mar. 30, 1984, Ser. No. 595,056

Claims priority, application Netherlands, May 19, 1982, 8202080

Int. Cl.[4] B28B *3/00*; B28C *5/20*

U.S. Cl. 264—333 **6 Claims**



1. A method for manufacturing light-weight shaped concrete articles comprising the steps of blending a mass of loose substantially sphere-shaped particles of a foamed plastic material with a binder to form a sticky mass, then adding a first portion of dry cement and blending again until the mass consists mainly of loose spheres coated with a film of dry cement, and subjecting the cement coated spheres to a second mixing operation with a second portion of cement while metering in a quantity of water, and pressing the mixture thus obtained into the desired shape, wherein the binder consists of a mixture of a phenol-free solution of 75–85% by weight of coal-tar pitch having a ring and ball softening point of 50°–65° C. in 15–25% by weight of coal-tar oil having a distillation range of 150°–275° C. and 20–35% by weight of an epoxy resin.

4,547,332

METHOD OF FORMING TAMPER EVIDENT CLOSURES

Edward J. Drozd, Jr., Lake Hiawatha, N.J., assignor to Captive Plastics, Inc., Piscataway, N.J.

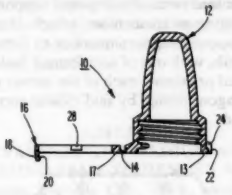
Division of Ser. No. 476,147, Mar. 17, 1983, Pat. No. 4,489,843. This application Aug. 7, 1984, Ser. No. 638,607

Int. Cl.[4] B29C *17/02*

U.S. Cl. 264—339 **1 Claim**

1. A method of forming a tamper-evident closure of the type including a threaded cap and a tamper-evident ring removably connected to each other by break-away tabs, said method including the steps of molding the threaded cap and tamper-evident ring as an integral unit in side-by-side relationship to each other with the break-away tabs integrally interconnecting them, with a retaining lug on said ring and having a substantially inwardly directed surface, with an outwardly directed

shelf on said cap, and with cam surface means on said cap; and, after removing the integrally molded part from its forming mold; moving said tamper-evident ring and said threaded cap relative to each other; with the break-away tabs serving as a hinge to bend without breaking to bring the threaded cap and tamper-evident ring into substantially vertical alignment, and holding them with respect to each other while in said alignment by snapping the inwardly directed surface of the retaining lug over the shelf to complete the formation of the closure so that the closure is ready for securement onto a cooperating container, whereupon the rotation of the cap to remove it causes the surface means to enable the cap to rotate with respect to the tamper-evident ring, whereupon the tabs break and the tamper-evident ring remains on the container but unsecured to the cap to provide evidence of the opening of the closure.

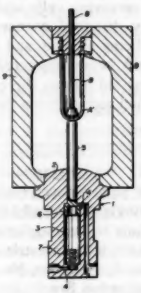


4,547,333

APPARATUS FOR BIAXIAL-BLOW-MOLDING HOLLOW BOTTLE-SHAPED CONTAINER OF SYNTHETIC RESIN AND METHOD OF BIAXIAL-BLOW-MOLDING THE SAME CONTAINER

Takuzo Takada, Ojima, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

Filed Feb. 14, 1983, Ser. No. 466,784
Claims priority, application Japan, Feb. 15, 1982, 57-19485
Int. Cl.[4] B29C *17/07*
U.S. Cl. 264—532 **6 Claims**



1. An apparatus for biaxial-blow-molding a hollow bottle-shaped container of a synthetic resin comprising:

a mold comprising a bottom mold portion and an upper mold portion, said bottom mold portion having an upper surface for forming a bottom surface of a bottle-shaped container, and a cylinder chamber formed therein, said upper mold portion having a cavity for forming the bottle-shaped container, said upper portion being split into a plurality of upper mold sections;

a reciprocally movable orientation pin extending from one end of said upper mold portion into the cavity and towards said upper surface of said bottom mold portion and movable in opposition to a bottom protruding pin during blow molding to a position wherein a lower end of said orientation pin is adjacent said bottom surface;

a bottom protruding pin movable reciprocally in said mold cavity and having an upper end face at a first end thereof, said upper end face forming part of said upper surface of said bottom mold portion wherein said bottom protruding pin is retracted and a piston portion formed at a second end thereof, said piston portion being movable reciprocally in said cylinder chamber for moving said bottom protruding pin reciprocally in said mold cavity; and

a resilient member disposed in said cylinder chamber for urging said bottom protruding pin into said mold cavity by contacting said resilient member with said piston portion of said bottom protruding pin for releasing said container from said bottom mold portion whereby pressure exerted on said bottom protruding pin by said resilient member when said bottom protruding pin is in the vicinity of its retraction limit is not greater than an opposite pressure exerted by said orientation pin in said mold cavity during blow molding, said resilient member being contacted by and compressed substantially only when said piston portion is in the vicinity of the retraction limit of said bottom protruding pin.

4. A method of biaxial-blow-molding a hollow bottle-shaped container of a synthetic resin comprising the steps of:

inserting a retractable bottom protruding pin through an upper surface of a bottom mold portion and a bottom wall of an upper mold portion along a central axis thereof, said bottom protruding pin having an upper surface positioned in a cavity of said upper mold portion;

suspending a parison in said cavity of said upper mold portion by holding a neck portion of said parison at an upper section of said upper mold portion;

inserting an orientation pin into said parison;

holding a bottom portion of said parison between a bottom end face of said orientation pin and said upper surface of said bottom protruding pin;

moving said orientation pin towards said bottom mold portion and retracting said bottom protruding pin simultaneously into said cylinder chamber while holding said bottom portion of said parison between said bottom end face of said orientation pin and said upper surface of said bottom protruding pin, thereby axially orienting said parison wherein pressure exerted by said orientation pin during blow molding is greater than an opposing pressure exerted by a resilient member on said piston portion of said bottom protruding pin only in the vicinity of the retraction limit of said protruding pin;

blowing compressed air into said parison thereby laterally orienting said parison to form a blow-molded bottleshaped container; and

extending said bottom protruding pin towards a bottom portion of said blow-mold bottle-shaped container by a pressure exerted on said piston portion of said bottom protruding pin by said resilient member thereby releasing said blow-molded bottle-shaped container from said upper surface of said bottom mold portion.

4,547,334

LOW EXCHANGE ELEMENT FOR NUCLEAR REACTOR

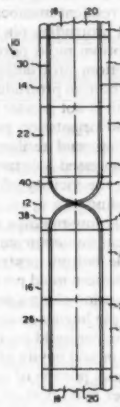
Rudolf H. Brogli, Aarau, Switzerland; Bangalore I. Shamasunder, and Shivaji S. Seth, both of Encinitas, Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 26, 1981, Ser. No. 296,502
Int. Cl.[4] G21C *3/30, 15/02*
U.S. Cl. 376—389 **10 Claims**

1. In a gas-cooled nuclear reactor having a pressure vessel, a core disposed within said pressure vessel, said core having a plurality of fuel elements arranged in an array wherein hotter and cooler regions exist at different radial locations at any vertical level within said core, the combination comprising

a plurality of prism-shaped nuclear fuel elements, each hav-

ing an upper face, a lower face, vertical sidewalls and a plurality of vertical coolant passageways extending between its upper and lower faces and interior of its sidewalls through which coolant gas flows, said array including a plurality of stacks of said fuel elements with said vertical passageways in upper elements of each stack being aligned and vertical passageways in lower elements of each stack being aligned, and in at least some of said stacks flow-exchange means disposed between said upper stacked fuel elements and said lower stacked fuel elements, said flow exchange means each having a top face,



a bottom face, vertical sidewalls and a plurality of non-intersecting passageways extending between its top face and its bottom face and within its sidewalls, each of said plurality of non-intersecting passageways connecting a coolant passageway in the next upper fuel element to a coolant passageway in the next lower fuel element, at least some of said connecting passageways in said flow-exchange means being disposed at an angle to the vertical for shifting the coolant flow between a vertical passageway at one side of the next upper fuel element and a vertical passageway at another side of the next lower fuel element.

4,547,335

FUEL ROD SUPPORT GRID

Robert E. Downs, Monroeville, and Ambrose L. Schwallie, Greensburg, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 233,226, Feb. 10, 1981, abandoned. This application Aug. 15, 1983, Ser. No. 523,293

Int. Cl.[4] G21C *3/34*

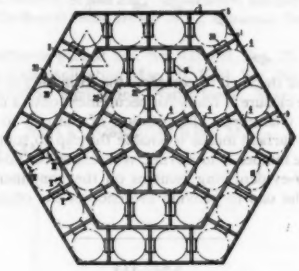
U.S. Cl. 376—442 **6 Claims**

1. A grid for supporting fuel rods for use in nuclear reactors, said grid having the cross-sectional configuration of a regular hexagon, and the fuel rods which are supported by said grid being so disposed that the centers of any three mutually adjacent of said rods form the apexes of an equilateral triangle, said grid comprising:

a centrally disposed support member sized to support a single fuel rod and comprising a single strap;

a plurality of elongated strap members each having the general configuration of a regular hexagon and positioned concentrically about said centrally disposed support member, the dimensions of each of said strap members being such as to receive and retain between the centrally disposed support member and the next immediately surrounding concentric strap member and also between all concentric strap members hexagonally conformed and closely spaced single rows of fuel rods;

a plurality of web members bridging the spacing between adjacent turns of each of said strap members and affixed to said strap members and perpendicularly disposed with respect to said strap members, each of said web members spaced from one another a predetermined distance to form with said strap members a plurality of individual fuel-rod-receiving cells, said web members also bridging the spacing between said centrally disposed support member and the surrounding strap member which is closest to said centrally disposed support member to form six fuel-rod-receiving cells, with one of said formed fuel-rod-receiving cells disposed proximate each of the corner portions of the regular hexagon formed by said closest surrounding strap member; and



the remainder of said web members forming with remaining hexagonally conformed strap members six additional fuel-rod-receiving cells for each additional concentric strap member which surrounds that hexagonal strap member which is closest to said centrally disposed support member, with one of the formed fuel-rod-receiving cells disposed proximate each of the corner portions of the regular hexagon formed by each of said concentric strap members, the centers of all fuel rods as supported by all of said formed fuel-rod-receiving cells which are positioned between oppositely disposed corners of the hexagonally conformed grid being aligned, and all other formed fuel-rod-receiving cells being staggered with the centers of fuel rods as supported by any three mutually adjacent of such supported fuel rods forming the apexes of an equilateral triangle.

4,547,336

METHOD FOR THE MANUFACTURE OF PISTON RING INSERTS BY A POWDER METALLURGY TECHNIQUE

Duraid Mahrus, and Luiz N. Benitez, both of Sao Paulo, Brazil, assignors to Meal Leve S.A. Industria e Comercio, Brazil

Filed Jan. 4, 1983, Ser. No. 455,481

Claims priority, application Brazil, Jan. 11, 1982, 18200106

Int. Cl.[4] B22F *3/00*

U.S. Cl. 419—31 **3 Claims**

1. A piston ring insert made from an austenitic ferrous alloy, wherein said ring insert is manufactured by a powder-metallurgy method comprising:

melting in a furnace a charge of said austenitic ferrous alloy; the constituents of said alloy charge comprising in weight percentage: 2.5–4.0% of C, 1.0–3.0% of Cr, 11.0–25.0% of Ni, 1.0–9.0% of Mn, 1.0–4.0% of Si, 1.0–8.0% of Cu and the balance of Fe;

pouring the molten alloy and atomizing it by means of a stream of water, air or gas, for producing powder having grain size ranging from +40 to −325 U.S. mesh, an austenitic white cast iron structure and virtually no green resistance;

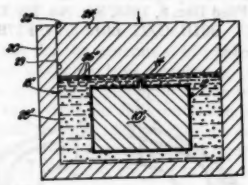
annealing the particulate material in a reducing atmosphere;
adding a lubricant to the annealed particulate material in an amount such that upon subsequent compacting of the particulate material to its final form said material will present the highest green density possible;
compacting said material to its final form;
burning off the lubricant in a protective atmosphere;
sintering the compacted material and cooling it down rapidly so as to increase carbon solubility within the austenitic alloy thereby improving the mechanical properties of said material; whereby said insert has higher stress resistance than ring inserts of the same alloy produced without use of powder metallurgy.

4,547,337

PRESSURE-TRANSMITTING MEDIUM AND METHOD FOR UTILIZING SAME TO DENSIFY MATERIAL

Walter J. Rozmus, Traverse City, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Division of Ser. No. 372,563, Apr. 28, 1982, Pat. No. 4,428,906. This application Jan. 19, 1984, Ser. No. 572,076
The portion of the term of this patent subsequent to Jan. 31, 2001, has been disclaimed.
Int. Cl.[4] B22F *3/14*
U.S. Cl. 419—49 **1 Claim**



1. A method for consolidating material (10) of metallic and nonmetallic compositions and combinations thereof to form a densified compact (10') of a predetermined density wherein a quantity of such material (10) which is less dense than the predetermined density is encapsulated in a pressure-transmitting medium (18) to which external pressure is applied to the entire exterior of the medium to cause a predetermined densification of the encapsulated material by hydrostatic pressure applied by the medium in response to the medium being substantially fully dense and incompressible and capable of fluidic flow at least just prior to the predetermined densification, comprising utilizing a pressure-transmitting medium (18) of a rigid interconnected skeleton structure (26) which is collapsible in response to a predetermined force and a fluidizing material (28) capable of fluidity and supported by the skeleton structure (26), and applying pressure to collapse the skeleton structure (26) to produce a composite (18') of structure fragments dispersed in the fluidizing material (28') with the composite (18') being substantially fully dense and incompressible and fluidic at the predetermined densification of the compact (10'), said pressure-transmitting medium having pressure applied thereto by being disposed in a pot die (20) having interior walls (22) extending from the pressure-transmitting medium and moving a ram (24) into the pot die (20) in close sliding engagement with the interior walls (22) to engage the pressure-transmitting medium and utilizing a fluidizing material (28) which remains rigid while being heated until it reaches a predetermined temperature at which it becomes fluidic and capable of plastic flow, and characterized by cooling and solidifying the fluidizing material (28') at the interface between the interior walls (22) and the ram (24) to provide a seal for preventing the flow of the fluidizing material (28') between the ram (24) and the interior walls (22).

4,547,338

FE-NI-CR CORROSION RESISTANT ALLOY

Paul J. Grobner, Ann Arbor; Armand P. Bond, Livonia, and Abraham Poznansky, Ann Arbor, all of Mich., assignors to AMAX Inc., Greenwich, Conn.

Filed Dec. 14, 1984, Ser. No. 681,730
Int. Cl.[4] C22C *30/00*
U.S. Cl. 420—584 **4 Claims**

1. A corrosion-resistant alloy consisting essentially of about 0.015% to about 0.025% carbon, not more than about 1% manganese, not more than about 0.3% silicon, about 19% to about 22% chromium, about 8.5% to about 9.5% molybdenum, about 30% to about 42% nickel, up to about 0.2% nitrogen, with the nickel and nitrogen contents being so related that at 30% nickel, the nitrogen content is at least about 0.15%, while at a nickel content of at least about 40%, the nitrogen content does not exceed about 0.03%, and the balance essentially iron, said alloy being resistant to the corrosive effects encountered within the scrubbers employed in flue gas treatment to remove therefrom sulfur oxides generated by the burning of coal.

4,547,339

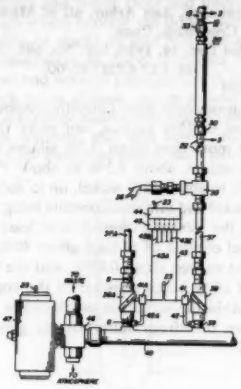
METHOD OF STERILIZING A FILLING MACHINE APPARATUS

Harry A. McClure, Durham, Pa., assignor to Adtech, Inc., Lansdale, Pa.

Division of Ser. No. 385,500, Jun. 7, 1982,. This application Oct. 31, 1983, Ser. No. 547,120
Int. Cl.[4] A61L *2/00, 2/04*
U.S. Cl. 422—26 **13 Claims**

1. A method of sterilization of filling machine apparatus of the type having at least one dispensing nozzle having an inlet end normally coupled to a source of product to be dispensed and having an outlet end through which product is discharged, comprising the steps of,
(a) isolating said at least one nozzle from the source of product to be dispensed,
(b) coupling the filling machine apparatus at a point upstream of the nozzle inlet end to a source of fluent sterilizing medium,
(c) inserting and sealing the nozzle into an autoclave having an insert opening into which the dispensing nozzle is insertable, having sealing means for sealing the autoclave insert opening with the nozzle therewithin, and having a discharge opening, and
(d) passing a fluent sterilizing medium from its coupling to the filling machine apparatus for a predetermined length of time first down, through the inside of the nozzle and next up around the outside of the dispensing nozzle, between the outside of the nozzle and a flow reversing means provided within the autoclave, and then down the outside of said flow reversing means and out through the

autoclave discharge opening at a point proximate to the outlet end of said nozzle thereby sterilizing the inside of



the nozzle, the outside of the nozzle and all points upstream thereof.

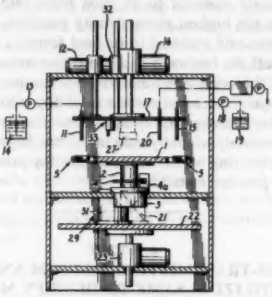
4,547,340

AUTOMATIC EXTRACTOR

Sannosuke Sanuki, Hamuramachi, and Hideyuki Morikawa, Akikawa, both of Japan, assignors to Kabushiki Kaisha Daini Seikosha and Sanuki Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Jul. 19, 1983, Ser. No. 515,366
Claims priority, application Japan, Jul. 26, 1982, 57-129057
Int. Cl.⁴ G01N *31/00*
U.S. Cl. 422—116 **14 Claims**

1. An automatic extractor apparatus comprising: a centrifugal turntable equipped with a high speed rotation driving mechanism and capable of stopping at a plurality of predetermined, desired rotary stop positions; a plurality of treating vessel supports for supporting treating vessels in such a manner so as to permit the treating vessels to undergo a rocking motion, the supports being disposed in angularly spaced relation around the peripheral portion of said turntable; a plurality of suction-discharge nozzles for effecting various treatment steps such as suction and discharge of a solution inside said treating vessels, charging of a reagent, and suction of the solution after reaction, the nozzles being disposed above the turntable at predetermined stop positions thereof; shaking means for shaking the treating vessels and a heating tank for storing the treating vessels, the shaking means and heating tank being disposed at predetermined stop positions of the turntable; and means for automatically and sequentially carrying out the rotation and stopping of rotation of said turntable, the operation of the



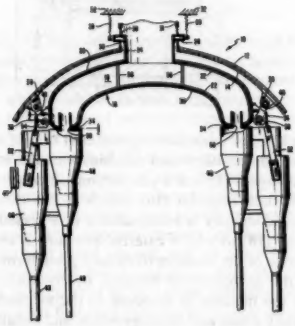
suction-discharge nozzles, the operation of said shaking means, the operation of said heating tank and the centrifuging of the treating vessels in accordance with a predetermined program.

4,547,341

CYCLONE SUPPORT SYSTEM

P. Stan Weber, Baytown, Tex., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 8, 1983, Ser. No. 559,326
Int. Cl.⁴ B01D *45/12*; B01J *8/24*; F27B *15/08*
U.S. Cl. 422—147 **11 Claims**



1. An improved support system for internal components of a high temperature vessel such as a catalytic reactor or regenerator comprising a vessel having an outer metallic shell, a gaseous discharge opening in an upper portion thereof, a refractory insulating lining on the interior of said shell, a plurality of cyclones arranged in at least two concentric rings about an upper portion of said vessel, a floating circular plenum separate from and interior of said vessel outer shell fixedly connected to said cyclones to receive gas discharged therefrom, a plurality of short radial brackets affixed to the outer periphery of said plenum, said brackets being located in pairs substantially vertically above the outer periphery of each of the cyclones in the outer ring of cyclones, substantially vertical strap means extending between each of the cyclones in said outer ring and a pair of said brackets thereabove for supporting said cyclones from said brackets, said inner concentric ring of cyclones arranged to receive gaseous discharge from said outer ring of cyclones and being fixedly secured to and supported from an area of said plenum immediately adjacent and radially inward from said brackets, and a plurality of link means pivotally attached at one end in a common horizontal plane to said vessel shell and at their other ends to said brackets in a common horizontal plane, the point of pivotal attachment of each said link to each said bracket being radially positioned to substan-

tially balance the weight radially inward of said point of pivotal attachment against the weight of the cyclones located radially outward of said point of pivotal attachment, whereby bending stresses in said suppport system are minimized and the combined weight of said plenum and cyclones is transmitted to said shell in tension through said pivoted link means.

4,547,342

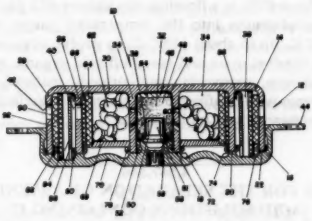
LIGHT WEIGHT WELDED ALUMINUM INFLATOR

Gary V. Adams, Perry; Wilbur J. Ahlf, Ogden; Donald J. Cunningham, North Ogden, and David P. Dahle, Logan, all of Utah, assignors to Morton Thiokol, Inc., Chicago, Ill.

Filed Apr. 2, 1984, Ser. No. 595,774

Int. Cl.[4] C01B *21/02*

U.S. Cl. 422—166 **11 Claims**



1. An inflator for the generation of gas to inflate vehicle inflatable crash protection bags comprising,

a solid gas generant composition which is operable upon ignition to produce gas and combustion products,

ignition means to ignite said gas generant composition,

initiator means to actuate said ignition means,

filter means to cool said gas and to trap said combustion products, and

first and second structural components,

said first structural component having three concentric cylinders which extend from a common wall means and define three concentric chambers with the inner chamber containing said ignition means, the intermediate chamber containing said gas generant composition, and the outer chamber containing said filter means, and with outlet ports in the outer one of said cylinders for the outflow of generated gas and with other ports in the inner cylinders for the passage of generated gas from chamber to chamber and then through the outlet ports in the outer cylinder,

said second structural component containing said initiator means, having an attachment flange, and providing concentric mating surfaces for the concentric cylinders of said first structural component, the concentric cylinders of said first structural component being welded to the concentric mating surfaces of said second structural component.

4,547,343

STERILIZER

Motoharu Takano; Masaru Sugimura; Keiichi Kushima, all of Tokyo, and Atae Ezaki, Saitama, all of Japan, assignors to Q. P. Corporation, Tokyo, Japan

Filed Mar. 14, 1983, Ser. No. 475,213

Claims priority, application Japan, Apr. 16, 1982, 57-63582; Oct. 8, 1982, 57-177283; Oct. 29, 1982, 57-190480

Int. Cl.[4] A23B *7/06*; A61L *3/00*

U.S. Cl. 422—304 **6 Claims**

1. A sterilizer comprising:

(a) a high-pressure sterilizing tank;

(b) a cooling tank;

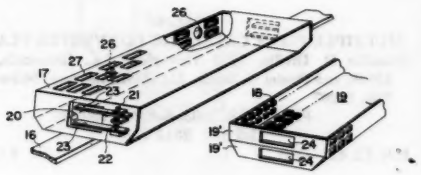
(c) right and left transfer chain means positioned spaced apart to provide support for transfer containers therebetween and provided so as to circulate through said high-pressure sterilizing tank and said cooling tank;

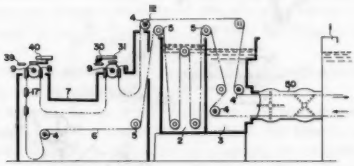
(d) a plurality of transfer containers wherein each of said transfer containers is supported between said transfer chain means, each of said transfer containers comprising two longitudinal end walls, a lateral side wall, a bottom wall, a top wall, and an open lateral side, each of said transfer containers having means defining a plurality of holes in said walls;

(e) a plurality of inner vessels, each inner vessel comprising two longitudinal walls, two lateral side walls, a bottom wall, and an open top, each of said inner vessels being capable of containing materials to be sterilized, each of said inner vessels being removably insertable through said open lateral side in each of said transfer containers;

(f) each of said inner vessels being provided with locking means at both longitudinal end walls thereof and each of said transfer containers being provided with resilient locking members at both longitudinal end walls thereof, said locking members being engageable with said locking means; and

(g) an unlocking member provided at a portion of said sterilizer at which said inner vessels are discharged, said unlocking member provided to release said resilient locking





members from engagement with said locking means of said inner vessels.

3. A sterilizer having

(a) a high-pressure sterilizing tank,

(b) a cooling tank,

(c) right and left transfer chain means positioned spaced apart to provide support for transfer containers therebetween and provided so as to circulate through said high pressure sterilizing tank and said cooling tank;

(d) transfer containers, each of said transfer containers being supported between said transfer chain means and each of said transfer containers having two longitudinal end walls, a lateral side wall, an open lateral side, a bottom wall, a top wall and means defining a plurality of holes in the walls thereof;

(e) inner vessels, each of said inner vessels having two longitudinal end walls, two lateral side walls, a bottom wall and an open top, each of said inner vessels being capable of containing materials to be sterilized, each of said inner vessels having means defining a plurality of holes in the walls thereof and being provided with locking means at both longitudinal end walls thereof, each of said inner vessels being removably insertable through said open lateral side of said transfer containers, each of said transfer

containers also being provided at both longitudinal end walls thereof with resilient locking members engageable with said locking means of said inner vessels; and

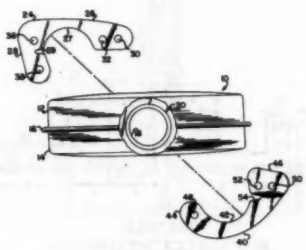
(f) an inner vessel insertion and discharge means comprising parts of said transfer chain means, said parts of said transfer chain means being run around a pair of front intermittent-driving wheels and a pair of rear intermittent-driving wheels, said parts of said transfer chain means being slack in front of said front intermittent-driving wheels, behind said rear intermittent-driving wheels, and between said front and rear intermittent-driving wheels, an inner vessel insertion unit provided in front of said front intermittent-driving wheels for introducing an inner vessel from a feed means for supplying materials to be sterilized into said transfer containers, an unlocking member for releasing said resilient locking members from engagement with said locking means of said inner vessels, an inner vessel discharge unit for pushing said inner vessels out of said transfer containers onto a treated material removal means provided behind said rear intermittent-driving wheels, and inner vessel guide members being provided between said feed means and said front intermittent-driving wheels and between said treated material removal means and said rear intermittent-driving wheels.

4,547,344

MULTIPLE PIECE CATALYTIC CONVERTER FLANGE

Franklin D. Divilio, 6250 Thornridge La., Greendale, Wis. 53129, and Daniel G. Woda, 331 E. Wilbur Ave., Milwaukee, Wis. 53207

Filed Sep. 9, 1983, Ser. No. 530,507
Int. Cl.⁴ B01J *12/00*
U.S. Cl. 422—310 **6 Claims**



1. A multiple piece converter flange for replacement of the original welded flange on a catalytic converter used to join the catalytic converter to a muffler pipe flange,

where the catalytic converter has upper and lower halves joined so as to form a web extending outwardly from and running along the circumference of the converter and having a cylindrical outlet, said multiple piece converter flange comprising:

a first converter flange piece having an arcuate edge portion for mating with a portion of the cylindrical outlet of the catalytic converter and having a plurality of openings for alignment with corresponding openings on a second converter flange piece, corresponding openings on the muffler pipe flange and corresponding openings on a support bracket and

a second converter flange piece having an arcuate edge portion for mating with another portion of the cylindrical outlet of the catalytic converter and having a plurality of openings for alignment with corresponding openings on said first converter flange piece, corresponding openings on the muffler pipe flange and corresponding openings on a support bracket.

4,547,345

RECOVERY OF MOLYBDENUM FROM SPENT CATALYST SOLUTIONS OBTAINED FROM HYDROPEROXIDE EPOXIDATIONS

Roger F. Sebenik; Jerry D. Baker, both of Ann Arbor, Mich., and John M. Laferty, Wheatridge, Colo., assignors to AMAX Inc., Greenwich, Conn.

Filed Mar. 14, 1984, Ser. No. 589,387
Int. Cl.⁴ C01G *39/00*
U.S. Cl. 423—53 **6 Claims**

1. The process for recovering molybdenum dissolved in a spent molybdenum containing tarry epoxidation catalyst mass of high organic content resulting from epoxidation of an olefin, said catalyst being made by dissolving molybdenum in an organic acid containing a small amount of a hydroperoxide and said spent catalyst mass including organic process reactants, products, and byproducts, which comprises heating said catalyst mass having a dissolved molybdenum content of about 0.5% to about 40% in a flowing atmosphere of a gas non-reactive to molybdenum into the temperature range of at least about 400° C. up to about 1100° C. to evolve organic material from said catalyst mass and carry off said organic material in said gas stream, recovering said organic material from the off-gas stream with unaffected fuel value and producing a solid residue containing said molybdenum.

4,547,346

PROCESS FOR THE SEPARATION OF ARSENIC FROM ACID SOLUTIONS CONTAINING IT

Renato Guerriero, Mestre; Giuseppe Veronese, Padova; Agostino Baradel, and Luigi Rivola, both of S.Donato Milanese, all of Italy, assignors to SAMIM Societa Azionaria Minero-Metallurgica S.p.A., Rome, Italy

Filed Jul. 3, 1984, Ser. No. 627,565
Claims priority, application Italy, Jul. 7, 1983, 21977 A/83
Int. Cl.⁴ C01B *27/00*
U.S. Cl. 423—87 **10 Claims**

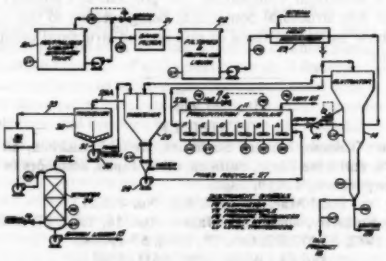
1. A process for the separation of arsenic from acid aqueous solutions containing arsenic and other metals which comprises treating the acid aqueous solution containing arsenic with a water-immiscible organic solvent consisting essentially of at least one alcohol having 5 to 13 carbon atoms, the ratio of the organic solvent to the aqueous solution being 0.1 to 10.

4,547,347

GRANULOMETRIC CONTROL OF NICKEL SULFIDE PRECIPITATE

Guy W. Lussiez, Golden, and Lauren B. Ames, Wheat Ridge, both of Colo., assignors to AMAX Inc., Greenwich, Conn.

Filed Dec. 2, 1983, Ser. No. 557,504
Int. Cl.⁴ C01G *53/00*
U.S. Cl. 423—141 **2 Claims**



1. In the method for precipitating nickel as nickel sulfide on a continuous basis from an acidic nickel sulfate solution containing up to about 15 gpl nickel, about 30 to about 400 gpl of a soluble inert sulfate salt and having a pH of about 1.5 to about 4 by means of hydrogen sulfide at a pressure of up to about psig

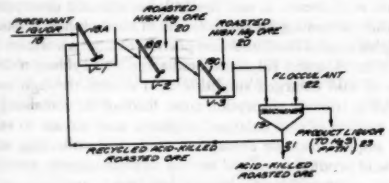
and temperatures of about 65° C. to about 100° C. wherein said solution is fed to a pressurized reactor system along with about 75 up to about 300 gpl of fine nickel sulfide seed material, nickel sulfide is precipitated on the surfaces of said seed material, the solid material from the reactor is classified with the finer material constituting the bulk of the solids being recycled with the coarser material from classification being product, and wherein the surface area of recycled nickel sulfide seed material upon continued operation coarsens such that nickel sulfide production rate becomes uneconomic when said seed surface area concentration drops below 10,000 square centimeters per liter the improvement for controlling the average particle size of the seed material in the reactor within a required size distribution range which comprises introducing therein a small but effective amount up to about 5% of product sulfide weight of fine supplmental new nickel sulfide material from a source in addition to the recycled classified fine material, said supplemental new nickel sulfide seed material being ground to an average particle size D_{50} of about 12 micrometers to provide new nuclei such that the surface area of seed material fed to said reactor is maintained within the range of about 10,000 square centimeters per liter to about 40,000 square centimeters per liter of said sulfate solution and continuous production of nickel sulfide at a high production rate and with high recovery of nickel over an extended period of time is maintained.

4,547,348

CONDITIONING OF LATERITE PRESSURE LEACH LIQUOR

Guy W. Lussiez, Golden; Jean-Paul Duterque, Arvada, both of Colo., and Thomas W. Polkinghorn, Ft. Madison, Iowa, assignors to AMAX Inc., Greenwich, Conn.

Filed Feb. 2, 1984, Ser. No. 576,293
Int. Cl.[4] C01G *53/10*
U.S. Cl. 423—150 **28 Claims**



1. A method for conditioning nickel laterite pregnant leach liquor in preparation for the recovery of nickel therefrom which comprises:

feeding nickel-containing pregnant leach liquor having a free acid concentration of about 10 to 80 gpl H_2SO_4 and a temperature ranging from about 60° C. to 100° C. to a reaction vessel under atmospheric pressure, mixing an amount of roasted high magnesium nickeliferous silicate ore containing over 5% Mg with said pregnant liquor in said reaction vessel at said atmospheric pressure to form a pulp thereof,

said amount of roasted ore being at least sufficient to lower the free acid content of pregnant liquor to a level corresponding to a pH ranging from about 1.8 to 3 referred to room temperature,

conditioning said pregnant liquor in said reaction vessel at atmospheric pressure by vigorously stirring said pulp at a temperature selected from said temperature range for a time sufficient to lower the free acid content of and thereby condition said pregnant liquor and to effect substantial precipitation of iron hydroxide and dissolved silica in said liquor at said pH ranging from about 1.8 to 3,

passing the treated pulp to a thickener to provide an underflow of residual roasted ore and an overflow of conditioned pregnant liquor at said pH ranging from about 1.8 to 3, passing said pregnant liquor overflow to metal recovery,

withdrawing said residual roasted ore from said thickener, and

recycling a portion of said residual roasted ore to said reaction vessel while adding freshly roasted ore to said pregnant liquor fed to the reaction vessel, and while maintaining a flow of said recycle residual roasted ore through said reaction vessel,

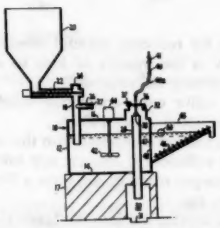
the ratio by weight of recycle residual ore to the freshly roasted ore added to the pregnant liquor ranging from about ½ to 1 to 5 to 1.

4,547,349

METHOD OF SLAKING LIME

Stanley C. Lane, Seattle, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Division of Ser. No. 328,272, Dec. 7, 1981, Pat. No. 4,436,703.
This application Dec. 2, 1983, Ser. No. 557,503
Int. Cl.[4] C04B *1/06*
U.S. Cl. 423—164 **2 Claims**



1. In a method of slaking lime comprising introducing lime and an aqueous liquor into a vessel and allowing excess vapor in the vessel to escape through a vent pipe, the improvement wherein

(a) the lime is introduced into the vessel through a substantially vertical conduit,

(b) the aqueous liquor is introduced into the same conduit at a point which is below that at which the lime is introduced, with the aqueous liquor entering the conduit at a tangential velocity such that the liquor flows down the conduit in a cyclonic path,

(c) the lime and aqueous liquor are discharged into the vessel below the level of liquor in the vessel,

(d) the excess vapor in the vessel is allowed to escape through a substantially vertical vent pipe extending from the vapor space through the floor of the vessel to a space below the vessel, and

(e) water is sprayed into the vent pipe to prevent accumulation of scale, whereby the water and the vapor flow down through the vent pipe and are discharged into the space below the vessel.

4,547,350

ABATEMENT OF INDOOR POLLUTANTS

Hyman D. Gesser, 218 Girton Blvd., MB R3P 0A7 Winnipeg, Manitoba, Canada

Filed Feb. 9, 1983, Ser. No. 465,051
Int. Cl.[4] B01D *47/00*; C01B *21/00*
U.S. Cl. 423—210 **10 Claims**

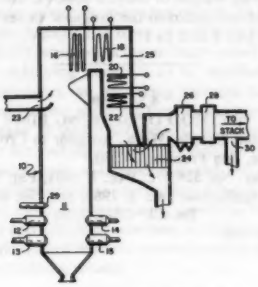
8. A method of reducing the indoor air concentration of aldehydes by allowing the air containing the aldehyde to come into contact with polymers which have free residual hydrazine functional groups.

4,547,351

FLUE GAS DESULFURIZATION

Kwan H. Im, Lisle, and Rajesh K. Ahluwalia, Clarendon Hills, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 1, 1984, Ser. No. 605,951
Int. Cl.[4] B01D *53/34;* B01J *10/00;* F23J *15/00*
U.S. Cl. 423—242 **10 Claims**



6. A process for reducing harmful effects of Na_2SO_4 in a combustion gas in the transfer of heat to at least one heat exchanger comprising the steps of

providing a sulfur oxide-containing combustion gas at a temperature above about 1400 K.,

introducing a sodium compound into the combustion gas in an amount sufficient to convert said sulfur oxide to Na_2SO_4 in a gas-gas reaction and form a Na_2SO_4-containing combustion gas,

introducing a cooling gas into the Na_2SO_4-containing combustion gas to reduce the temperature of the combustion gas to below about 1150 K. and form particles of Na_2SO_4 in a cooled combustion gas, directing the cooled combustion gas past at least one heat exchanger, and withdrawing a portion of the cooled combustion gas downstream of said one heat exchanger as said cooling gas.

4,547,352

RETICULATED PUFFED BORAX HAVING ENHANCED ABSORPTIVE CAPACITY

Raymond T. Ertle, Pompton Plains, N.J., assignor to Capital City Products Company, Columbus, Ohio

Continuation-in-part of Ser. No. 358,050, Mar. 15, 1982, Pat. No. 4,412,978. This application Aug. 18, 1983, Ser. No. 524,399
Int. Cl.[4] C01B *35/12*
U.S. Cl. 423—279 **16 Claims**

1. A method for enhancing the absorptive capacity of puffed borax particles, comprising contacting the particles with a sufficient amount of a composition consisting essentially of water to dissolve portions of the exterior and interior cellular walls of the said particles to thereby form a reticulated puffed borax having enhanced absorptive capacity.

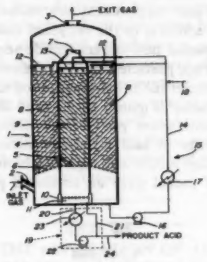
11. A reticulated puffed borax particle comprised of a plurality of cells adjacent to each other, wherein a major portion of the cell walls have openings therein to thereby interconnect the cells.

4,547,353

APPARATUS AND PROCESSES FOR THE CONCENTRATION OF SULPHURIC ACID

Gordon M. Cameron, North York, Canada, assignor to C-I-L Inc., North York, Canada

Filed Dec. 20, 1984, Ser. No. 684,077
Claims priority, application Canada, Jan. 27, 1984, 446257
Int. Cl.[4] C01B *17/98, 17/48;* B01D *47/00*
U.S. Cl. 423—522 **3 Claims**



1. A process for producing concentrated sulphuric acid from a hot wet gas stream comprising water and sulphur trioxide which process comprises feeding a first portion of said gas stream through a first sulphur trioxide absorption zone and a second portion through a second sulphur trioxide absorption zone, said second absorption zone being in parallel flow arrangement with said first absorption zone; feeding a recycled sulphuric acid stream to said first sulphur trioxide absorption zone while removing subtantially all of the sulphur trioxide and sulphuric acid from said first portion of said gas stream to produce an enlarged sulphuric acid stream; recycling a first portion of said enlarged sulphuric acid stream through said first sulphur trioxide absorption zone; feeding the remaining a second portion of said enlarged sulphuric acid stream to said second sulphur trioxide absorption zone; and collecting sulphuric acid product from said second sulphur trioxide absorption zone; wherein the ratio by weight of gas to sulphuric acid in said second sulphur trioxide absorption zone is such that the sulphuric acid product leaving said zone is of greater than 75% concentration to a maximum of the azeotropic concentration.

4,547,354

PROCESS FOR PREPARING HYDROGEN PEROXIDE

Frances S. Pinault, Hopewell, N.J., assignor to Atlantic Richfield Company, Los Angeles, Calif.

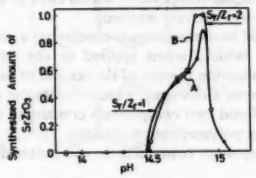
Filed Oct. 31, 1983, Ser. No. 547,193
Int. Cl.[4] C01B *15/02*
U.S. Cl. 423—587 **3 Claims**

1. In a process for the production of hydrogen peroxide wherein tertiary butyl hydroperoxide is contacted with water in the presence of an acid in a hydrolysis zone maintained at a temperature within the range of about 80° to 125° C., the improvement which comprises adding an organic solvent selected from the group consisting of ortho-dichlorobenzene, chlorobenzene, 1,1,1-trichloroethane, 1,2-dichloroethane, nitrobenzene and anisole to the hydrolysis zone to promote the partitioning of (a) tertiary butyl alcohol and organic hydrolysis byproducts comprising di-tertiary butyl peroxide, acetone and methanol and (b) hydrogen peroxide into separate organic and aqueous phases respectively, and recovering hydrogen peroxide product from the separated aqueous phase.

4,547,355
METHOD FOR MANUFACTURING FINE POWDER OF $SRZRO_3$

Satoru Uedaira; Hiroshi Yamanoi; Masayuki Suzuki; Hidemasa Tamura, all of Kanagawa, and Hiroyuki Suzuki, Miyagi, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 26, 1984, Ser. No. 624,818
Claims priority, application Japan, Jun. 27, 1983, 58-115475
Int. Cl.[4] C01F *11/00;* C01G *25/00*
U.S. Cl. 423—593 6 Claims



1. A method of manufacturing fine powder of strontium zirconate which comprises the steps of:

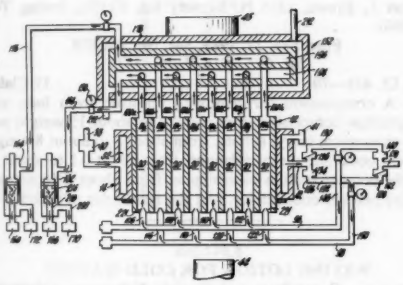
reacting an oxide type hydrolyzate of a water soluble zirconium compound with a strontium compound in a strongly alkaline aqueous solution of a pH not less than 14.45 for a time sufficient to complete the reaction at a temperature not lower than 88° C., thereby forming $SrZrO_3$ as a precipitate;

separating the precipitate from the solution; and drying the precipitate to obtain a fine powder of $SrZrO_3$.

4,547,356
METHOD OF GENERATING HYDROGEN AND USING THE GENERATED HYDROGEN

Ronald I. Papineau, Goshen, Mass., assignor to Unique Energy Systems, Inc., Holyoke, Mass.

Division of Ser. No. 175,597, Aug. 5, 1980, Pat. No. 4,371,500, which is a continuation of Ser. No. 921,000, Jun. 30, 1978, abandoned. This application Jan. 3, 1983, Ser. No. 454,988
Int. Cl.[4] C01G *41/14;* H01M *8/18, 8/04;* F02B *75/12*
U.S. Cl. 423—658 20 Claims



1. In an energy system, the method of producing hydrogen comprising:

placing porous material in a reaction zone of a reactor;

heating said reaction zone;

heating water;

feeding the water at elevated temperatures through said reaction zone for interaction with the porous material resulting in the disassociation of hydrogen from the water; and

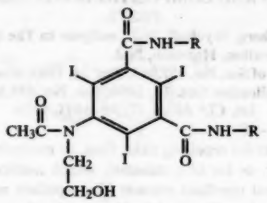
diffusing the resulting hydrogen through said porous material to separate the hydrogen from the water and diassociated oxygen.

4,547,357
N-HYDROXYETHYLATED 2,4,6-TRIIODOAMINOISOPHTHALIC ACID BISTRIHYDROXYBUTYLAMIDES, THEIR PREPARATION AND X-RAY CONTRAST MEDIA CONTAINING THEM

Heinrich Pfeiffer; Wolfgang Muetzel, and Ulrich Speck, all of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Dec. 20, 1982, Ser. No. 451,374
Claims priority, application Fed. Rep. of Germany, Dec. 18, 1981, 3150916
Int. Cl.[4] C07C *103/78;* A61K *49/04*
U.S. Cl. 424—5 18 Claims

1. An N-hydroxyethylated 2,4,6-triiodoaminoisophthalic acid bistrihydroxybutylamide of the formula



wherein R is trihydroxybutyl with the exception of 1,1,1-trishydroxymethylmethyl.

4,547,358
SUSTAINED RELEASE TABLET CONTAINING AT LEAST 95 PERCENT THEOPHYLLINE

Stephen T. David; Dana Brooke, and Claude E. Gallian, all of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 451,891, Dec. 21, 1982, Pat. No. 4,465,660, which is a continuation of Ser. No. 249,787, Apr. 1, 1981, abandoned, which is a continuation-in-part of Ser. No. 147,429, May 6, 1980, abandoned. This application Jun. 4, 1984, Ser. No. 616,982
Int. Cl.[4] A61K *31/52, 9/20*
U.S. Cl. 424—14 29 Claims

1. A sustained release pharmaceutical tablet comprising 95% to 99.8% by weight of theophylline, and the remainder conventional pharmaceutical tablet ingredients selected to provide a tablet that remains intact during dissolution, said tablet having a pair of substantially planar opposing faces joined by edge walls and a thickness of from 0.08 to 0.12 inches which when administered to a human in a therapeutically effective amount at consecutive 12 hour intervals affords a continuous blood serum concentration of from 10 mcg/ml to 20 mcg/ml of theophylline during said intervals.

4,547,359
DIVISIBLE PHARMACEUTICAL TABLET WITH DELAYED ACTIVE INGREDIENT RELEASE

Bernd Zierenberg, and Arun R. Gupte, both of Ingelheim am Rhein, Fed. Rep. of Germany, assignors to Boehringer Ingelheim KG, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Mar. 21, 1984, Ser. No. 591,988
Claims priority, application Fed. Rep. of Germany, Apr. 18, 1983, 3314003
Int. Cl.[4] A61K *9/26, 9/44, 31/78*
U.S. Cl. 424—22 4 Claims

1. A pharmaceutical delayed active ingredient release tablet

wherein the rate of release of active ingredient from any fragment thereof is the same and independent of the size and nature of the total surface area, consisting of a compressed tablet-making composition comprising finely divided active ingredient-containing emulsion-polymerized polyacrylate material having a particle size between 10 and 500 microns ground below the glass temperature without the excipients, conventional tablet-making excipients and active ingredient with a molecular weight of up to about 500 and a diffusion coefficient of about 10^{-5} to 10^{-7} cm^2/hr molecularly dispersed in said polyacrylate material.

4,547,360

METHOD AND COMPOSITIONS FOR REPELLING PESTS

William Perlberg, Wyckoff, N.J., assignor to The Hartz Mountain Corporation, Harrison, N.J.

Continuation of Ser. No. 457,944, Jan. 14, 1983, abandoned. This application Oct. 16, 1984, Ser. No. 661,867

Int. Cl.[4] A01N *37/34;* **A01L** *9/04*

U.S. Cl. 424—45 **11 Claims**

1. A method for repelling ticks, fleas, or mosquito pests from the skin, hair, or fur of a mammal, which method comprises applying a pest repellant amount of a repellant which is cyano(3-phenoxyphenyl)methyl-4-chloro-alpha-(1-methylethyl)-benzeneacetate to said skin, hair, or fur.

4,547,361

STABILIZING OF CINNAMIC ALDEHYDE-CONTAINING FLAVORS WITH PROPYLENE GLYCOL AND DIPROPYLENE GLYCOL

Robert J. Steltenkamp, Somerset; Miriam L. Douglass, and Gerard E. Natarelli, both of Piscataway, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Feb. 10, 1984, Ser. No. 578,942

Int. Cl.[4] A61K *7/16, 7/26*

U.S. Cl. 424—49 **17 Claims**

1. A white dentifrice formulation having improved stability against yellowing discoloration upon aging, comprising about 0.1–1% by weight of an unsaturated aldehyde-containing flavorant selected from the group consisting of cinnamic aldehyde and citral, which is subject to discoloration with aging, and an effective amount in excess of 5% by weight of propylene glycol or dipropylene glycol to impart color stability against aging, in a dental vehicle free of oxidizing agents and having a slightly acid to alkaline pH below 8.5.

4,547,362

SODIUM-BICARBONATE-CONTAINING TOOTH POWDER

Anthony Winston, East Brunswick; Anthony Ansaldi, Mt. Arlington, and Norman Usen, Marlboro, all of N.J., assignors to Church & Dwight Co., Inc., Piscataway, N.J.

Continuation-in-part of Ser. No. 475,355, Mar. 14, 1983, abandoned. This application Jul. 9, 1984, Ser. No. 628,855

Int. Cl.[4] A61K *7/16, 7/18*

U.S. Cl. 424—49 **6 Claims**

1. A dentifrice composition comprising at least 50% by weight of sodium bicarbonate particles as a dental abrasive material, said sodium bicarbonate particles having a median particle size within the range of 74 to 210 microns; 0.05 to 3.0% by weight of a flavoring agent, and 0.20% to 3.0% by weight of a sweetener, said dentifrice composition being in the form of a tooth powder.

4,547,363

PREPARATION FOR STRENGTHENING, PARTICULARLY HARDENING, LIVING FINGER NAILS

Bernhard Joos, Riva Paradiso 32, 6900 Lugano, Switzerland

Filed Jun. 1, 1982, Ser. No. 384,087

Claims priority, application Switzerland, Jun. 26, 1981, 4233/81

Int. Cl.[4] A61K *7/04, 7/06;* **B65D** *69/00*

U.S. Cl. 424—61 **8 Claims**

1. A preparation for improving the strength of living nails, particularly the hardness of living nails, comprising:

two separate liquid components which have to be separately stored and successively applied;

the first of said two components containing a polymerizable compound which, when applied to the nail and after further application thereto of the second of said two components, forms a covering which covers the entire nail;

the second of said two components containing a compound serving as a polymerization catalyst;

said first component containing as the polymerizable compound:

dimethylol ethylene thiourea and which is present in an amount constituting at least 18 percent-by-weight of the total weight of said first component;

theophylline in an amount of about 0.1 to 0.2 percent-by-weight of said first component;

water;

a water-miscible organic solvent mixture comprising acetone, ethyl acetate and ethanol in a 2:1:1 ratio; and

said first component having a pH-value in a range of approximately 8 to 10;

said second component containing as the polymerization catalyst:

0.1n to 0.5n hydrochloric acid in a quantity sufficient to adjust and maintain a pH-value in the range of 1 to 3 in said second component;

amino acetic acid as an agent favoring film formation in an amount of about 0.3 to 1.0 percent-by-weight of said second component; and

a water-miscible organic solvent mixture comprising acetone, ethyl acetate and ethanol in a 2:1:1 ratio.

4,547,364

HAIR TREATMENT PRODUCT

Robert L. Brown, 1321 N. Nursery Rd. #115C, Irving, Tex. 75061

Filed Feb. 22, 1983, Ser. No. 468,695

Int. Cl.[4] A61K *7/06, 35/78*

U.S. Cl. 424—70 **11 Claims**

1. A composition for removing chlorine from hair, said composition comprising from about 2 to about 15 weight percent ammonium lauryl sulfate, from about 2 to about 8 weight percent cocamide diethanolamine, from about 0.1 to about 75 weight percent sodium bicarbonate, from about 2 to about 8 weight percent cocobetaine, and the remainder of water.

4,547,365

WAVING LOTION FOR COLD WAVING

Sanae Kubo, Sagamihara, and Fumiaki Nakamura, Yokohama, both of Japan, assignors to Shiseido Company Ltd., Tokyo, Japan

Filed Oct. 27, 1983, Ser. No. 545,816

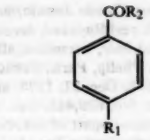
Claims priority, application Japan, Nov. 8, 1982, 57-195799

The portion of the term of this patent subsequent to Oct. 15, 2002, has been disclaimed.

Int. Cl.[4] A61K *7/09, 7/11;* **A61L** *13/00*

U.S. Cl. 424—71 **6 Claims**

1. In an aqueous waving lotion for cold waving comprising (i) a mercapto compound, the improvement wherein such composition further contains (ii) at least one compound selected from the group consisting of the compounds having the general formulae (I) to (XX),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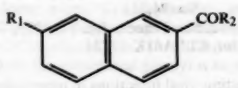
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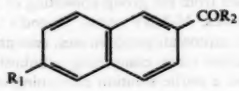
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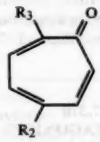
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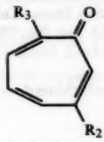
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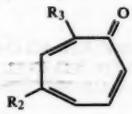
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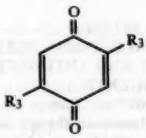
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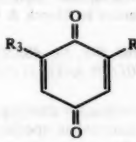
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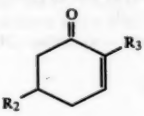
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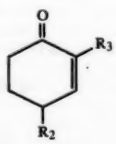
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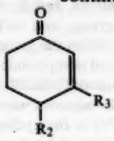
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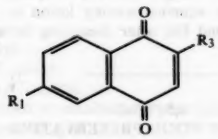
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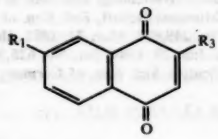
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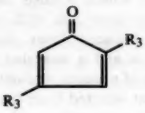
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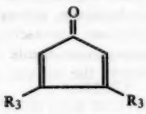
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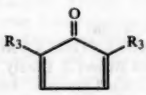
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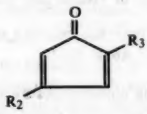
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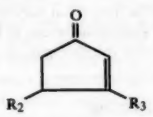
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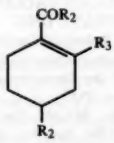
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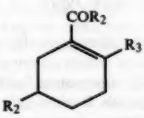

(XX)

wherein R_1 is hydrogen, $COCH_3$, COC_2H_5, COC_3H_7,

$OCOCH_3$, $OCOC_2H_5$, $OCOC_3H_7$, Cl, Br, I, $SCOCH_3$, SCN, CN, CF_3, $N^+(CH_3)_3$, or NO_2, R_2 is hydrogen or an alkyl group having 1 to 4 carbon atoms, and R_3 is hydrogen, a hydroxyl group, or a methyl group, and (iii) at least one cyclodextrin compound selected from the group consisting of α-, β-,, γ-, and δ-cyclodextrins, said compounds (ii) and (iii) being contained, in total, in an amount of 0.0002% to 40% by weight based on the total weight of the aqueous waving lotion and the mole ratio of the compound (ii) to the cyclodextrin (iii) in the aqueous waving lotion being 1:9 to 1:1, compound (ii) being incorporated into the aqueous waving lotion as a mixture thereof with compound (iii) after dissolving in an organic liquid.

4,547,366

AQUEOUS WOOD PRESERVATIVE

Hans-Norbert Marx, Buehl-Weitenung, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 249,688, Mar. 31, 1981, abandoned. This application Jun. 29, 1984, Ser. No. 625,980

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1980, 3014194

Int. Cl.[4] **A01N** *43/50*

U.S. Cl. 424—78 **5 Claims**

1. A wood preservative which consists essentially of an aqueous solution containing from 5 to 40% by weight of a neutralized alkyd resin produced from phthalic acid or phthalic anhydride, glycerol and a saturated fatty acid and from 0.5 to 5% by weight of a water insoluble fungicidal or insecticidal active ingredient selected from the group consisting of 2,5-dimethylfuran-3-carboxylic acid N-methoxy-N-cyclohexylamide, tributyl-tin benzoate, tributyl-tin naphthenate, gamma-hexachlorocylohexane, pentachlorophenol laurate, 2-methoxycarbonylamino-benzimidazole or a mixture of these active ingredients wherein the solvent system consists essentially of water.

4,547,367

HEPATITIS B CORE ANTIGEN VACCINE

Edward Tabor, Rockville, and Robert J. Gerety, Potomac, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Dec. 20, 1983, Ser. No. 563,369

Int. Cl.[4] **A61K** *39/29*

U.S. Cl. 424—89 **4 Claims**

1. A method of protecting chimpanzees by administering a vaccine prepared by a process which comprises centrifuging and isolating HBcAg from the liver of an infected chimpanzee, mixing said HBcAg with a suitable adjuvant to form a vaccine and injecting said vaccine into the chimpanzee.

4,547,368

HEPATITIS B CORE ANTIGEN VACCINE MADE BY RECOMBINANT DNA

Edward Tabor, Rockville, and Robert J. Gerety, Potomac, both of Md., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 563,369, Dec. 20, 1983,. This application Aug. 6, 1984, Ser. No. 637,880

Int. Cl.[4] **A61K** *39/29*

U.S. Cl. 424—89 **3 Claims**

1. A method of protecting chimpanzees by administering a vaccine prepared by a process which comprises centrifuging and isolating HBcAg from the supernatant fluid of cloned cells containing recombinant hepatitis B virus DNA, mixing said HBcAg with a suitable adjuvant to form a vaccine, and injecting said vaccine into a chimpanzee.

4,547,369

ANTIVIRAL AGENT

Jean-Claude Chermann, Garches; Claude Jasmin, and Georges Mathe, both of Villejuif and Marcel Raynaud, deceased, late of Garches, by Odette J. Raynaud, heir, Versailles, all of France, assignors to Cabinet Harle & Phelip, Paris, France

Continuation of Ser. No. 862,671, Dec. 21, 1977, abandoned, which is a continuation of Ser. No. 639,413, Dec. 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 491,368, Jul. 24, 1974, abandoned. This application Sep. 11, 1979, Ser. No. 74,514

Claims priority, application France, Jul. 27, 1973, 73 27536

Int. Cl.[4] **A61K** *33/24*

U.S. Cl. 424—131 **5 Claims**

3. A method of treating viral infections in mammals wherein the viruses are selected from the group consisting of leukemia viruses, sarcoma viruses, M-MSV virus, Friend's leukemia virus, plasma variant, sarcomatogenic viruses, encephalomyocardia virus, and rabies virus comprising administering to mammals by injection a sterile solution containing an antivirally effective amount of a non-toxic, pharmaceutically acceptable salt selected from the group consisting of alkali metal, alkaline earth metal and ammonium of 9-antimonio-III-21-tungsto VI sodate.

4,547,370

GNRH ANTAGONISTS

Roger W. Roeske, Indianapolis, Ind., assignor to The Salk Institute For Biological Studies, San Diego, Calif.

Filed Nov. 29, 1983, Ser. No. 556,148

Int. Cl.[4] **C07C** *103/52;* **A61K** *37/02*

U.S. Cl. 514—15 **19 Claims**

1. A peptide or a nontoxic salt thereof, said peptide having the formula:

$$X\text{-}\beta\text{-D-2NAL-}R_2\text{-D-Trp-Ser-Arg-}R_6\text{-}R_7\text{-Arg-Pro-}R_{10}$$

wherein X is hydrogen or acetyl; R_2 is 4Cl-D-Phe, 4F-D-Phe, or C^{α}Me-4Cl-D-Phe, R_6 is D-Tyr, β-D-2NAL or D-Arg; R_7 is Leu or N^{α}Me-Leu; and R_{10} is Gly-NH_2, $NHCH_2CH_3$ or D-Ala-NH_2.

4,547,371

SUBSTITUTED CEPHALOSPORIN SULFONES AS ANTI-INFLAMMATORY AND ANTI-DEGENERATIVE AGENTS

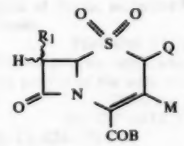
James B. Doherty, New Milford; Bonnie M. Ashe, Scotch Plains; Paul E. Finke, Metuchen; Shrenik K. Shah, Clark; Kevan R. Thompson, Westfield, and Morris Zimmerman, Watchung, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 18, 1983, Ser. No. 485,978

Int. Cl.[4] **C07D** *501/20;* **A61K** *31/545*

U.S. Cl. 514—200 **7 Claims**

1. A pharmaceutical composition for treating and managing inflammatory conditions in mammalian species comprising a non-toxic pharmaceutical carrier and an effective amount of a compound of structural formula:



(I)

wherein M is:

(1) trifluoromethyl;

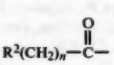
(2) chloro or fluoro;

(3) —COOH;

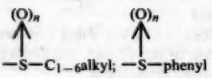
(4) —CHO; or
(5) —CH_2A wherein A represents
(a) hydrogen;
(b) halo;
(c) hydroxy;
(d) C_{1-6}alkoxy;
(e) —O-phenyl or —O-substituted phenyl wherein the phenyl is substituted with one or more functional groups selected from a group consisting of C_{1-6}alkyl, C_{1-6}alkoxy, C_{1-6}alkylthio, C_{1-6}alkanoyl, C_{1-6}alkanoyloxy; nitro, C_{1-6}alkylamino, amino, halo, CF_3, CF_3S—, C_{1-6}alkylsulfinyl and C_{1-6}alkylsulfonyl;
(f) —OCH_2phenyl or —OCH_2-substituted phenyl wherein the substituted phenyl is as previously defined;
(g)

wherein R_5 is C_{1-6}alkyl, phenyl, substituted phenyl, —CH_2-phenyl or —CH_2-substituted phenyl; n is an integer of 0–2;
(h) —S—COR_5;
(i) C_{1-6}alkanoyloxy;
(j) phenylcarbonyloxy;
(k) —NH_2, —NHC_{1-6}alkyl, or —$N(C_{1-6}alkyl)_2$;
(l) —$CONH_2$, —$CONHC_{1-6}$alkyl, or —$CON(C_{1-6}alkyl)_2$; or
(m) —$OCONHC_{1-6}$alkyl or —$OCONH_2$;

R_1 is
(1) R'NH— wherein R' represents
(A) H;
(B)



where R^2 represents
(a) H;
(b) C_{1-3}alkyl;
(c) CF_3;
(d) —CH_2—O—C_{1-3}alkyl;
(e) —CH_2CN;
(f) thienyl;
(g) phenyl or substituted phenyl as previously defined; n is an integer of 0 to 2;
(C) R^2—X_1—$(CH_2)_n$CO— wherein X_1 is O or S; R^2 and n are as defined previously; or
(D)



or substituted phenyl wherein substituted phenyl is as previously defined; and n is 0, 1 or 2;
(2) amino, —NHC_{1-6}alkyl, or —$N(C_{1-6}alkyl)_2$;
(3) nitro;
(4) azido;
(5) nitroso;
(6) isocyanato;
(7) isothiocyanato;
(8) hydroxyamino; or
(9) —$CONH_2$, —$CONHC_{1-6}$alkyl, or —$CON(C_{1-6}alkyl)_2$;

B is
(1) OB_1 wherein B_1 is
(a) C_{1-6}alkyl;
(b) C_{1-6}alkenyl;
(c) C_{1-6}alkenoyl;
(d) C_{1-6}alkanoylC_{1-6}alkyl;
(e) C_{1-6}alkanoyloxyC_{1-6}alkyl;
(f) C_{1-6}alkoxyC_{1-6}alkyl;
(g) C_{1-6}alkynyl;
(h) —CH_2—phenyl or —CH_2 substituted phenyl as defined above;
(i) phenyl or substituted phenyl as defined above;
(j) C_{3-6}cycloalkyl;
(k) haloC_{1-6}alkyl;
(2) NB_2B_3 wherein B_2 is B_1; and B_3 is B_1 or hydrogen; and

Q is
(1) hydrogen;
(2) C_{1-6}alkyl;
(3) halo C_{1-6}alkyl;
(4) hydroxyC_{1-6}alkyl;
(5) [substituted or unsubstituted] methylene selected from a group consisting of
(a) —CH_2phenyl or —CH_2 sbustituted phenyl as defined above;
(b) —CH_2—S-phenyl or substituted phenyl as defined above;
(c) —CH_2SO-phenyl or substituted phenyl as defined above;
(d) —CH_2—SO_2-phenyl or substituted phenyl as defined above;
(6) C_{1-6}alkoxyC_{1-6}alkyl;
(7) [unsubstituted or substituted benzyl]—CH_2-phenyl or —CH_2-substituted phenyl as previously defined;
(8) phenyl-O—C_{1-6}alkyl or substituted phenyl-O—C_{1-6}alkyl wherein the substituted phenyl is as previously defined;
(9) phenyl-NH—C_{1-6}alkyl or substituted phenyl-NH—C_{1-6}alkyl wherein the substituted phenyl is as previously defined.

4,547,372

METHOD FOR BREWING SAKé

Itsuo Takeuchi, Kashiwa; Teruaki Yokoshima, Iwai; Noboru Tabata, Wakayama; Eishin Fujita, Akashi; Koshiro Nagata, Kobe, and Tetsuya Kishimoto, Noda, all of Japan, assignors to Kikkoman Corporation and Nado-Gogo Sake Brewers Common Facility Corporation, both of, Japan

Filed Nov. 22, 1983, Ser. No. 554,349
Claims priority, application Japan, Nov. 25, 1982, 57-205472
Int. Cl.[4] C12G *3/02*
U.S. Cl. 426—11 **2 Claims**

1. In a method for brewing sake in which koji, water, yeast and rice are combined as a mash and fermented and sake is recovered from fermented mash the improvement which comprises using a puffed rice as a starting material obtained by heat-treating at least one member selected from the group consisting of low-grade rice, broken rice, small-kernel hard rice, under-milled rice and old crop rice at a pressure of 3.0 kg/cm^2 or above and a temperature of 185° C. or above for one minute or less, and quickly discharging the treated rice into an atmosphere of ambient pressure.

4,547,373

WINE PREPARATION WITH NEW STRAINS OF *LEUCONOSTOC OENOS*

William E. Sandine, and David A. Heatherbell, both of Corvallis, Oreg., assignors to State of Oregon acting by and through the State Board of Higher Education for and on behalf of Oregon State University, Corvallis, Oreg.

Filed Aug. 11, 1983, Ser. No. 521,988
Int. Cl.[4] C12G *1/00*; C12N *1/20*
U.S. Cl. 426—15 **2 Claims**

1. Biologically pure cultures of strains of *Leuconostoc oenos* having assigned depository numbers ATCC39401 or ATCC39402, characterized by an ability in wines of relatively high acidity inoculated with the strains to carry out faster

malolactic fermentation than results with commercially available strains ML-34 and PSU-1.

2. In the making of wine, the method comprising inoculating the wine with a biologically pure culture of strains of *Leuconostoc oenos* selected from the group consisting of those having assigned depository numbers ATCC39401 and ATCC39402, and producing malolactic fermentation in the wine with the bacteria strain inoculated.

4,547,374

SACCHAROMYCES SPECIES FD 612 AND THE UTILIZATION THEREOF IN BREAD PRODUCTION

Yasuo Nakatomi, Chiba; Hiraku Saito, Osaka; Akihiro Nagashima, Chiba, and Fumio Umeda, Saitama, all of Japan, assignors to Oriental Yeast Co., Ltd., Tokyo, Japan

Filed May 5, 1983, Ser. No. 491,664

Claims priority, application Japan, May 21, 1982, 57-84699

Int. Cl.[4] A21D *8/04*; C12N *1/18*; C12R *1/85*

U.S. Cl. 426—19 **4 Claims**

1. A yeast consisting of Saccharomyces species FD 612 (FERM BP-742) having freeze resistance suitable for preparing frozen dough for bread production, and having the following taxonomic properties:

(a) growth state: abundant growth on YM agar medium;
a white, flat and smooth colony is formed thereon;
a vegetative cell is 2–7μ×2–9μ, circular-elliptic, and multiplicates by budding;

(b) spore formation: ascospores are formed on a potassium acetate medium; a spore is circular;

(c) physiological properties:
(1) optimum growth condition:
pH: 4.5–6.0;
temperature: 28°–30° C.;
aerobic or anaerobic: facultative aerobic;
(2) conditions for growth:
pH: 2.5–10.0;
temperature: 3°–40° C.;
aerobic or anaerobic: growable under both;
(3) nitrate assimilation: negative;
(4) vitamin requirement: pantothenic acid and biotin are required;

(d) carbon source utilization and fermentation:

Carbon source	Utilization	Fermentation (Gas production)
D-arabinose	−	−
D-xylose	−	−
D-glucose	+	+
D-galactose	+	+
maltose	+	+
sucrose	+	+
lactose	−	−
melibiose	−	−
trehalose	+	±
raffinose	+	±
α-methyl-D-glucoside	+	+
dextrin	+	±
soluble starch	+	−
ethanol	+	

± means "positive" in acid production and "negative" in gas production;

(e) the segregation of auxotrophic traits observed:
the segregant strains isolated from Saccharomyces species FD 612 show that the number ratio of strains requiring adenine is about 1:1, and that the number ratio of strains requiring leucine is about 1:1.

4,547,375

GEL FORMATION IN TOMATO PRODUCTS

Robert E. Mersfelder, and Albert M. Ehrman, both of Cincinnati, Ohio, assignors to The Procter & Gamble Co., Cincinnati, Ohio

Filed Apr. 20, 1983, Ser. No. 486,634

Int. Cl.[4] A23L *1/212, 1/24*

U.S. Cl. 426—52 **14 Claims**

1. A process for minimizing flavor loss and controlling the consistency of a tomato product containing one or more members of the Allium botanical genus, comprising:

(a) maintaining a tomato product containing at least one or more tomato components in which naturally occurring pectin enzymes have been deactivated at a temperature below about 180° F. (82° C.) prior to sterilization;

(b) controlling consistency in the tomato product by one of the following:
(1) heating one or more members of the Allium botanical genus in water to a temperature of at least about 160° F. (71° C.) prior to its addition to the tomato product; or
(2) bringing the tomato product to a temperature of at least about 160° F. (71° C.) at which temperature one or more members of the Allium botanical genus will be added; or
(3) depolymerizing pectin substances naturally occurring in the tomato components by adding pectin enzymes with mild heating to a temperature below about 160° F. (71° C.) prior to addition of one or more members of the Allium botanical genus;

(c) adding the Allium to the tomato product; and

(d) sterilizing the product.

4,547,376

FRUIT CHIP PRODUCT AND PROCESS FOR MAKING SAME

Myron E. Silver, Lewisville, and Lawrence W. Wisdom, Dallas, both of Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Dec. 1, 1983, Ser. No. 556,850

Int. Cl.[4] A23L *1/212*

U.S. Cl. 426—102 **13 Claims**

1. A method for continuously and economically producing crisp and dry fruit or vegetable slices comprising the steps of:

(a) slicing whole fruit or vegetable pieces into thin, wafer-like slices;

(b) monolayering the slices with the planar surfaces of the slices in substantially the same plane and without substantial overlap of the slices;

(c) rapidly applying to the monolayered slices an aqueous film comprising a carbohydrate in aqueous solution, an anti-browning agent in aqueous solution and an acid in aqueous solution to substantially cover at least one surface of the monolayered slices with the aqueous film, wherein the titratable acidity of the slices is adjusted to alter the tartness of the slices; and

(d) rapidly drying the slices, while the slices are monolayered for at least a portion of the drying, the drying being continued to produce dried crisp slices.

4,547,377

STABILIZED SOLID COMPOSITIONS

Hiroe Ogawa, Kobe, and Yoshisuke Imamura, Kawanishi, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Mar. 17, 1983, Ser. No. 476,154

Claims priority, application Japan, Mar. 25, 1982, 57-48234

Int. Cl.[4] A23L *1/272*; A23J *3/00*

U.S. Cl. 426—268 **16 Claims**

1. A powdery human food or animal feed composition stabilized against caking and browning which comprises a physical mixture of separate components of

one or more sugars selected from the group consisting of monosaccharides and disaccharides and one or more

amino acids, in which said amino acids and sugars are present in amounts sufficient to produce caking and browning, and,

based on the content of said amino acids, at least 40% by weight of one or more polysaccharides, said polysaccharides having a water content of not more than 3%, said polysaccharides in said composition being in amounts sufficient to prevent both caking and browning.

4,547,378

ROASTED COFFEE EXTRACT DECAFFEINATION METHOD

Fouad Z. Saleeb, and Bary L. Zeller, both of Pleasantville, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 29, 1983, Ser. No. 566,605

Int. Cl.[4] A23F *5/22*

U.S. Cl. 426—271 **11 Claims**

1. A roasted coffee extract decaffeination method providing a soluble coffee of improved flavor which comprises:

(a) contacting an aqueous roasted coffee extract with a halogenated hydrocarbon caffeine solvent so that caffeine and a lesser amount of non-caffeine solubles are transferred from the roasted coffee extract to the caffeine solvent;

(b) separating the substantially decaffeinated roasted coffee extract and the caffeine-containing solvent;

(c) concentrating the caffeine solvent;

(d) contacting the concentrated solvent with an aqueous suspension of caffeic acid which suspension contains at least an equimolar amount of caffeic acid as caffeine in the solvent;

(e) filtering caffeic acid/caffeine complex crystals after they have grown in the water phase;

(f) separating the water phase from the caffeine solvent;

(g) adding the caffeine solvent which still contains non-caffeine solubles to the substantially decaffeinated roasted coffee extract of (b);

(h) stripping the caffeine solvent from the roasted coffee extract; and

(i) drying the coffee extract to provide a soluble coffee of improved flavor.

4,547,379

METHOD FOR CORNING MEAT

Erwin Möller, Wuppertal, and Siddik Iyimen, Lohmeyer Str. 46, 6600 Saarbrücken, both of Fed. Rep. of Germany, assignors to Siddik Iyimen, Saarbrücken, Fed. Rep. of Germany

Continuation of Ser. No. 428,916, Sep. 30, 1982, abandoned, which is a continuation of Ser. No. 244,300, Mar. 16, 1981, abandoned. This application Mar. 2, 1984, Ser. No. 584,297

Int. Cl.[4] A23B *4/00*; A23L *1/31*; A23P *1/00*

U.S. Cl. 426—281 **1 Claim**

1. A method of treating a piece of meat that has been injected with a pickling solution, comprising the steps of:

(a) introducing the piece of meat to be treated into a nip between two counterrotating rollers with parallel axes of rotation, one of said rollers having equispaced peripheral ridges parallel to said axes, the other of said rollers being smooth-surfaced;

(b) biasing said rollers toward each other with a substantially constant relative pressure tending to reduce the width of said nip between ridges of said one of said rollers and the smooth surface of the other roller to substantially less than the thickness of said piece of meat whereby spaced-apart strip zones of said piece of meat are compressed by said ridges while intervening expansion zones of said piece of meat are left uncompressed during transit through said nip; and

(c) thereafter agitating said piece of meat in pickling solution, said ridges having a width of about 1 cm and substantially equaling their spacing whereby the compressed zones and the intervening zones of said piece of meat are approximately of the same width, said ridges each compressing said piece of meat for a minimum period of about 0.1 second.

4,547,380

PROCESS OF PREPARING FROZEN FRUIT OR VEGETABLES

Bengt L. Bengtsson, Bjuv, Sweden, and Peter Lindberg, Concise, Switzerland, assignors to Nestec S.A., Vevey, Switzerland

Filed Dec. 1, 1983, Ser. No. 556,898

Claims priority, application European Pat. Off., Dec. 23, 1982, 82111953.4

Int. Cl.[4] A23B *7/04*; C12H *1/04*

U.S. Cl. 426—302 **8 Claims**

1. A process for the preparation of frozen fruit or vegetables, in which the volume of waste waters is reduced, comprising blanching the fruit or vegetables in an atmosphere containing steam, recovering condensate produced during said blanching, cooling the blanched fruit or vegetables in an essentially gaseous medium, freezing the cooled fruit or vegetables and glazing the frozen fruit or vegetables by contacting the frozen fruit or vegetables with at least some of the condensate produced during blanching.

4,547,381

DRY COMPOSITIONS FOR THE PRODUCTION OF CHLORINE DIOXIDE

John Y. Mason, Plymouth, and Bruce W. Hicks, Rio Linda, both of Calif., assignors to Rio Linda Chemical Co., Inc., Sacramento, Calif.

Filed Nov. 10, 1983, Ser. No. 550,560

Int. Cl.[4] B65B *55/00*; A61L *9/00*; A01N *59/00*

U.S. Cl. 426—316 **3 Claims**

1. A method of disinfecting and deodorizing an enclosed space consisting of placing in said enclosed space an effective amount of a dry composition for the sustained, controlled production of gaseous chlorine dioxide, said dry composition comprising (1) a dry, inert diluent, (2) a metal chlorite selected from the group consisting of alkali metal chlorites and alkaline earth metal chlorites, and (3) a dry agent capable of reacting with said metal chlorite in the dry state to produce chlorine dioxide, said agent being selected from the group consisting of dry oxidizing agents, dry acids, and combinations thereof.

2. A method of disinfecting and deodorizing an enclosed space consisting of placing in said enclosed space an effective amount of a dry composition for the sustained, controlled production of gaseous chlorine dioxide, said dry composition comprising (1) a dry, inert diluent, (2) a metal chlorite selected from the group consisting of alkali metal chlorites and alkaline earth metal chlorites, and (3) a dry agent capable of reacting with said metal chlorite in the dry state to produce chlorine dioxide, said agent being selected from the group consisting of dry oxidizing agents, dry acids, and combinations thereof; wherein said composition further comprises about 0.1% to about 95% by weight of said dry, inert diluent; about 0.1% to about 80% by weight of said metal chlorite; and about 0.1% to about 75% by weight of said agent which is capable of reacting in the dry state with said metal chlorite to produce chlorine dioxide; wherein the rate of chlorine dioxide production is controlled by selecting the appropriate particle sizes of the components of said composition; and wherein said metal chlorite is selected from the group consisting of calcium chlorite and sodium chlorite; said agent which is capable of reacting in the dry state with said metal chlorite to produce chlorine dioxide is selected from the group consisting of calcium hypochlorite, lithium hypochlorite, citric acid, oxalic acid, sodium bicarbonate, potassium dihydrogen phosphate, sodium bisulfate, and combinations thereof; and said dry, inert diluent is selected from the group consisting of diatomaceous earth, adsorbant clay, sodium chloride, sodium nitrate, disodium carbonate, and mixtures thereof.

3. A method of preserving boxed fruits and vegetables during the shipment thereof consisting of placing in the vicinity of

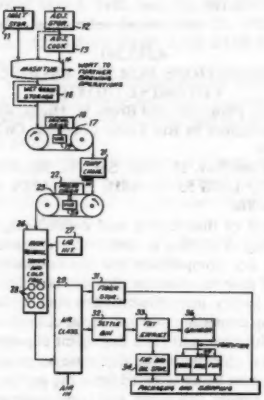
said boxed fruits and vegetables a gas permeable container containing an effective amount of a dry composition for the sustained, controlled production of gaseous chlorine dioxide, said dry composition comprising (1) a dry, inert diluent, (2) a metal chlorite selected from the group consisting of alkali metal chlorites and alkaline earth metal chlorites, and (3) a dry agent capable of reacting with said metal chlorite in the dry state to produce chlorine dioxide, said agent being selected from the group consisting of dry oxidizing agents, dry acids, and combinations thereof.

4,547,382

PROCESS OF SEPARATING HUSKS FROM DRIED SPENT GRAINS

James J. Gannon, Hawley, Pa., assignor to F.I.N.D. Research Corporation, Brooklyn, N.Y.

Division of Ser. No. 899,171, Apr. 24, 1978, Pat. No. 4,464,402.
This application Aug. 1, 1984, Ser. No. 636,587
Int. Cl.[4] A23L *1/10*; A23N *5/08*
U.S. Cl. 426—482 **4 Claims**



1. The process of separating husks from dried spent grains comprising the steps of:

subjecting dried spent grains produced in a mashing operation to a temperature suffieiently low to embrittle the same; and

exerting mechanical force on the embrittled grains to separate the husks from the grains while maintaining those grains at a sufficiently low temperature to keep them embrittled.

4,547,383

CONTINUOUS FOOD STERILIZATION SYSTEM WITH HYDROSTATIC SEALED TREATMENT CHAMBER

Stephen L. Goldhahn, Stratford, N.J., assignor to Campbell Soup Company, Camden, N.J.

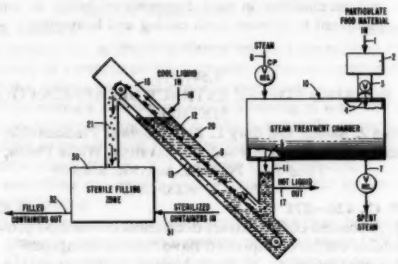
Filed Jun. 7, 1983, Ser. No. 501,821
Int. Cl.[4] A23L *3/16*
U.S. Cl. 426—524 **4 Claims**

1. A method for cooling particulate food material discharged from a pressurized steam treatment chamber having pressure-tight inlet and outlet openings comprising:

(a) providing hydrostatic sealing means to seal the outlet opening of the treatment chamber, said sealing means comprising a column of liquid in communication with the outlet opening and with a region of lower pressure, the liquid column having a height in the range of about 20 to about 130 feet for balancing a steam pressure in the range of about 10 to about 55 psig in the treatment chamber, said liquid constituting a broth for the treated particulate food material;

(b) discharging particulate food material from said treatment chamber to said liquid column;

(c) cooling the liquid of the hydrostatic sealing means; and



(d) conveying said discharged food material through said liquid column to said region of lower pressure so that the temperature of absorbed liquid in said food material is always below its boiling point at the pressure prevailing around the food material whereby the particulate food material is cooled and gradually depressurized as it is conveyed through the liquid column.

4,547,384

METHOD FOR ASEPTIC ADDITION OF DIPEPTIDE OF L-PHENYLALANINE AND L-ASPARTIC ACID TO PASTEURIZED DRINKS AND JUICES AND THE PRODUCT RESULTING THEREFROM

Allen C. Kryger, Holland, Mich., assignor to Squirt & Company, Holland, Mich.

Filed Mar. 12, 1984, Ser. No. 588,387
Int. Cl.[4] A23L *1/236, 2/00, 2/02*
U.S. Cl. 426—548 **12 Claims**

1. A method for aseptic addition of the sweetener comprising the dipeptide of L-phenylalanine and L-aspartic acid to pasteurized aseptic drinks and juices after pasteurization, said method comprising:

dissolving substantially in excess of 9 grams of said sweetener per 100 milliliters of water at approximately room temperature, by adding an excess by weight of malic acid, citric acid or mixtures thereof, the ratio of said acid to said sweetener being at least about 1.5 to 1 by weight;

followed by sterilizing and adding said solution to a previously pasteurized juice or drink which has cooled to about room temperature.

4,547,385

PROCESS FOR THE PRODUCTION OF BEATABLE CREAM OF LOW FAT CONTENT

Nils C. Lindstam, Simrishamn, Sweden, assignor to Skanemejerier Ek. For., Sweden

Filed Nov. 10, 1983, Ser. No. 550,742
Claims priority, application Sweden, Nov. 12, 1982, 82064288
Int. Cl.[4] A23C *13/14*
U.S. Cl. 426—570 **6 Claims**

1. A process for the production of a beatable cream having a fat content of 17 to 31% by weight and a cold storage life of about 6 to 8 weeks, comprising:

(a) mixing natural cream with sweet buttermilk and heating and tempering it by alternate heating and chilling in the temperature range 10°–30° C., and then heating the cream to at least 60° C.;

(b) adjusting the pH of the mixture to about 5.95–6.25 by the addition of sour milk or sour buttermilk;

(c) allowing the pH-adjusted mixture to swell;

(d) homogenising the swollen mixture at a pressure of no

more than about 100 kg/cm^2 and at a temperature of at least about 60° C.;

(e) chilling the homogenised mixture;

(f) sterilising or pasteurising the mixture; and

(g) homogenising and chilling the mixture.

4,547,386

LACTOSE/CHEESE WHEY/WHEY FILTRATE SEMI-SOLID ANIMAL FEED SUPPLEMENT

James V. Chambers, Lafayette; T. Wayne Perry, West Lafayette, both of Ind.; Dennis A. Lonergan, Oakdale, Minn., and Jay S. Marks, Battle Ground, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Feb. 27, 1984, Ser. No. 583,958

Int. Cl.[4] A23K *1/08*

U.S. Cl. 426—583 19 Claims

1. A process for forming whey feed blocks consisting essentially of the steps of concentrating whey which has been held for a time sufficient to partially crystallize lactose in the whey to form a whey admixture having a solids content of at least about 45%,

adding up to 20% by weight of a hydrocolloid stabilizer for binding water in the whey admixture to form a gel-like structure,

adding from about 10 to about 20% dry weight of a salt selected from the group consisting of phosphate salts of calcium and magnesium to strengthen the gel-like structure of the whey admixture

adjusting the pH of the admixture to between about 4.0 and about 6.0, and

drying the admixture to form a feed block having a water content of less that about 32%.

4,547,387

EDIBLE EMULSIONS CONTAINING AMADORI REARRANGEMENT PRODUCTS

Klaus H. Todt, Hamburg, Fed. Rep. of Germany, and Wilhelmus A. M. Castenmiller, Vlaardingen, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

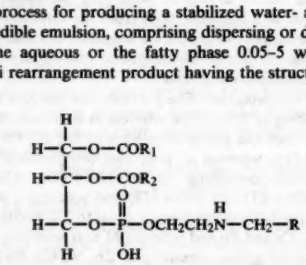
Filed Jun. 6, 1983, Ser. No. 501,743

Claims priority, application United Kingdom, Jun. 8, 1983, 8216630

Int. Cl.[4] A23D *3/00, 3/02*

U.S. Cl. 426—602 6 Claims

1. A process for producing a stabilized water- and oil-containing edible emulsion, comprising dispersing or dissolving in either the aqueous or the fatty phase 0.05–5 wt. % of an Amadori rearrangement product having the structure:



wherein R_1 and R_2 are identical or different, saturated or unsaturated fatty acid residues and R is a reducing carbohydrate selected from the group consisting of glucose, fructose, lactose and an oligosaccharide obtained by hydrolysis of starch.

4,547,388

PAN RELEASE AGENT AND ITS PREPARATION

Oran L. Strouss, Carson, Calif.

Continuation of Ser. No. 388,432, Jun. 17, 1982, abandoned, which is a division of Ser. No. 191,278, Sep. 26, 1980, Pat. No. 4,339,465, which is a continuation-in-part of Ser. No. 85,127, Oct. 15, 1979, abandoned. This application Jun. 12, 1984, Ser. No. 620,529

Int. Cl.[4] A21D *8/08;* A23D *5/00;* B01F *17/34*

U.S. Cl. 426—609 13 Claims

1. A liquid composition for use as a pan-release agent in bakeries, consisting essentially of a liquid emulsifier containing monoglycerides, diglycerides, and a polysorbate, and at least about 80 percent water by weight of the liquid composition.

4,547,389

METHOD OF MAKING SWEET PICKLES

Madhav P. Palnitkar, Southfield, Mich., assignor to Vlasic Foods, Inc., Bloomfield, Mich.

Filed Nov. 23, 1983, Ser. No. 554,680

Int. Cl.[1] A23L *1/218, 1/212*

U.S. Cl. 426—639 18 Claims

1. A method for producing sweet pickles having a sweetener content of greater than 30° Brix comprising:

(a) providing an acidified syrup, said acidified syrup initially containing at least about 70% sucrose by weight, and from about 1% to about 7% acid as acetic acid by weight;

(b) covering whole pickle stock without any significant prior sweetening treatment with said syrup, said pickle stock being sufficiently perforated through the outer membrane of said pickle stock so that the osmotic pressure generated by said syrup does not cause significant shrinkage of said pickle stock; and

(c) allowing the constituents of said acidified syrup to reach equilibrium concentration in said pickle stock and surrounding liquid phase by diffusion to produce sweet pickles substantially free of significant shrinkage and having a sweetener content of greater than 30° Brix.

4,547,390

PROCESS OF MAKING IMPLANTABLE PROSTHESIS MATERIAL OF MODIFIED POLYMERIC ACRYLIC (PMMA) BEADS COATED WITH PHEMA AND BARIUM SULFATE

Arthur Ashman, New York, N.Y., and Paul F. Bruins, Austin, Tex., assignors to Medical Biological Sciences, Inc., New York, N.Y.

Division of Ser. No. 357,739, Mar. 12, 1982, Pat. No. 4,535,485. This application Sep. 30, 1982, Ser. No. 428,746

Int. Cl.[4] A61K *5/00;* A61F *1/00;* B05D *7/00*

U.S. Cl. 427—2 1 Claim

1. A process for producing implantable prosthesis material comprising loose, individual, modified polymethylmethacrylate beads of a particle size which when implanted develop pore sizes that promote bone growth including the steps of:

(a) mixing polymethylmethacrylate beads with between about 10 and 20% by volume or between about 21.5 and 43% by weight of barium sulfate of particle size less than one micron;

(b) adding between about 4 and 7% by weight (of the polymethylmethacrylate beads) of monomeric hydroxyethyl methacrylate to the polymethylmethacrylatebarium sulfate mixture, and mixing said mixture to effect uniform coating of the PMMA beads;

(c) heating the mixture produced in step (b) with a dielectric heater while in a thin layer of about 1/16" to ¼" thickness until most of the hydroxyethyl methacrylate is polymerized;

(d) cooling the mixture to an ambient temperature between about 70 and about 80° F.;

(e) breaking up any clumps in the mixture;

(f) boiling the mixture in water for about 2 to 3 minutes to extract any remaining monomer; and

(g) spreading out the obtained modified polymethylmethacrylate beads for air-drying or force drying.

4,547,391

ARC DEPOSITION OF METAL ONTO A SUBSTRATE

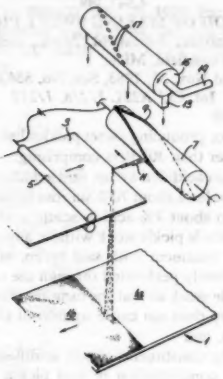
Walter N. Jenkins, Swansea, Wales, assignor to National Research Development Corporation, London, England

Filed May 21, 1984, Ser. No. 612,125

Claims priority, application United Kingdom, Jun. 3, 1983, 8315308

Int. Cl.⁴ B05D *1/02*

U.S. Cl. 427—37 **9 Claims**



1. A method of depositing metal on a substrate comprising the steps:

striking an arc between a non-consumable electrode and a strip-shaped metal feedstock to form molten metal;

advancing said feedstock strip toward said non-consumable electrode at a given speed;

repetitiously traversing said arc the length of a leading edge of said feedstock strip at a rate greater than said advancing speed; and

propelling, by gas jet or curtain, said molten metal toward said substrate,

wherein said gas is supplied to only a portion of said leading edge at a time, but covering the whole leading edge at a rate which is faster than said speed of advance of said feedstock strip.

4,547,392

METHOD FOR MAKING A TRANSFERRABLE DYE MEDIUM

Osamu Majima, and Shigemichi Honda, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 400,919, Jul. 22, 1982, abandoned. This application Mar. 9, 1984, Ser. No. 586,654

Claims priority, application Japan, Jul. 25, 1981, 56-109807[U]

Int. Cl.⁴ B05D *1/28*

U.S. Cl. 427—40 **20 Claims**

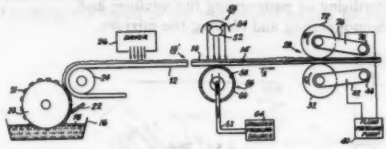
1. A method of making a thermally transferable dye medium for a thermal printer comprising the steps of:

providing a base layer;

coating a surface of said base layer with a dye layer comprised of a sublimable dye material dispersed in a binder and having a sublimation temperature less than a melting temperature of said binder to form a dye-coated base layer;

drying said dye layer on said base layer;

heating said dried dye layer at a temperature less than either of said melting and sublimation temperatures, thereby to soften said dried dye layer; and



calendering said softened dried dye-coated base layer so as to cause impregnation of at least a portion of said dye layer into said base layer.

4,547,393

METHOD FOR PREPARING A MAGNETIC RECORDING MEDIUM

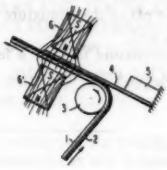
Takamitsu Asai, Tokyo; Tatsuji Kitamoto, and Goro Akashi, both of Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 438,568, Nov. 2, 1982, abandoned. This application Jun. 8, 1984, Ser. No. 618,803

Claims priority, application Japan, Nov. 2, 1981, 56-176260

Int. Cl.⁴ H01F *10/02*

U.S. Cl. 427—48 **23 Claims**



1. A method for preparing a magnetic recording medium comprising the steps of

(1) dispersing in a binder ferromagnetic fine particles which are plate-shaped and which have an axis of easy magnetization perpendicular to the plate of the particles in a binder and

(2) coating a magnetic coating layer on a non-magnetic support,

wherein the method includes, after coating the magnetic coating layer and before drying it, subjecting the surface of the magnetic layer to a magnetic filed from the direction perpendicular to the support to produce a magnetic orientation while contacting the surface of the magnetic coating layer with a flexible smoothening sheet, and

wherein the ferromagnetic fine particles are selected from the group consisting of $AFe_{12}O_{19}$, wherein A is at least one member selected from the group consisting of Ba, Sr, Pb and Ca; $A'Fe_{12-x}M_xO_{19}$, wherein A' is at least one member selected from the group consisting of In, $\frac{1}{2}Zn+\frac{1}{2}Ge$, $\frac{1}{2}Zn+\frac{1}{2}Nb$, $\frac{1}{2}Zn+\frac{1}{2}V$, $\frac{1}{2}Co+\frac{1}{2}Ti$ and $\frac{1}{2}Co+\frac{1}{2}Ge$ and wherein x is greater than or equal to 1.0 and less than or equal to 2.2; group consisting of Ba, Sr, Ca and Pb and wherein M is at least one member selected from the group consisting of Zn, Ni, Cu, Fe and Mn; $A'''Fe_{12-2y}Co_yM''_yO_{19}$ wherein A''' is at least one member selected from the group consisting of Ba, Sr, Pb and Co and wflerein M'' is selected from at least one member of the group consisting of Ti, Ge, $\frac{1}{2}Ti+\frac{1}{2}Ge$ and wherein y is greater than or equal to 0.5 and less than or equal to 1.1; and a hexacrystal cobalt alloy and MnBi.

4,547,394

USE OF HYDROXYALKYLPHENONES AS INITIATORS FOR RADIATION CURING OF AQUEOUS PREPOLYMER DISPERSIONS

Claus P. Herz, Heidelberg; Jörg Ohngemach, Reinheim, and Otto Stahlecker, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

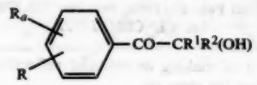
Filed Jan. 28, 1983, Ser. No. 461,906

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1982, 3203096

Int. Cl.⁴ C08F 2/50

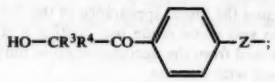
U.S. Cl. 427—54.1 20 Claims

1. An aqueous photopolymerizable composition comprising an effective amount of (A) an hydroxyalkylphenone photoinitiator of the formula



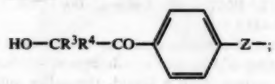
wherein

R is hydrogen, halogen, alkyl of 1 to 18 C atoms, alkoxy of 1 to 4 C atoms or



R_a is hydrogen, halogen or alkyl of 1 to 4 C atoms;

R^1 and R^2 (a) are each alkyl of up to 14 C-atoms and together have 4 to 16 C atoms or together are alkylene of 4 to 8 C atoms, when R is hydrogen, halogen, alkyl of 1 to 6 C atoms or alkoxy of 1 to 4 C atoms, or (b) are each alkyl of 1 to 6 C atoms or together are alkylene of 2 to 8 C atoms, when R is alkyl of 3 to 18 C atoms or



R^3 and R^4 are each alkyl of 1 to 6 C atoms or together are alkylene of 2 to 8 C atoms; and

Z is —CO—, —CH_2—, —O—, or —S—,

(B) 95–20 wt. % of a photopolymerizable ethylenically unsaturated prepolymer, and

(C) 5–80 wt % of water,

the amounts of (B) and (C) being relative to the total of B and C which is 100%.

4,547,395

PROCESS FOR THE PHOTOCHEMICAL VAPOR DEPOSITION OF HETERO-LINKED POLYMERS

James T. Hall, Redondo Beach, and Richard N. Leyden, Topanga, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Nov. 26, 1984, Ser. No. 674,627

Int. Cl.⁴ B05D 5/12

U.S. Cl. 427—54.1 14 Claims

1. Process for forming on the surface of a substrate a layer of a chosen organic polymer comprising repeating hydrocarbon units joined through an element selected from the group consisting of oxygen, nitrogen and sulfur, comprising exposing said substrate to a first vapor phase reactant comprising the monomer precursor of said repeating hydrocarbon units and a second vapor phase reactant comprising the precursor of said oxygen, nitrogen, or sulfur in the presence of radiation of a predetermined wavelength to bring about the reaction between said first and second vapor phase reactants to form said chosen polymer which deposits on said surface of said substrate.

4,547,396

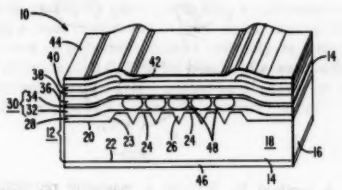
METHOD OF MAKING A LASER ARRAY

Dan Botez, Mt. Holly, and John C. Connolly, Cranbury, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Division of Ser. No. 505,489, Jun. 17, 1983, abandoned. This application Oct. 26, 1984, Ser. No. 665,538

Int. Cl.⁴ H01S 3/19

U.S. Cl. 427—87 8 Claims



1. A method of fabricating a laser array including a planar active layer comprising the steps of:

forming a plurality of corrugations on a surface of a substrate, said corrugations projecting outwards from the surface of the remainder of the substrate;

forming a first solution comprising the elements to be deposited and an element which is a solvent for the substrate material which has a super-saturated growth condition for planar and concave substrate surfaces and a slightly under-saturated growth condition for convex surfaces of the substrate;

contacting the surface of the substrate having the corrugations thereon to the first solution thereby causing a partial melting of the convex portions of the corrugations to form lands between the concave portions of the corrugations and causing the deposition of a first layer to occur over the concave portions of the corrugations and the lands until this layer has a planar surface; and

contacting the substrate with the first layer thereon to a different solution and cooling the different solution and substrate to deposit the active layer over the planar surface of the first layer.

4,547,397

TINTABLE SCRATCH RESISTANT COATING

Alfred J. Burzynski, and James J. Tillman, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 671,535, Nov. 15, 1984,. This application Mar. 25, 1985, Ser. No. 715,700

Int. Cl.⁴ B32B 3/00

U.S. Cl. 427—164 18 Claims

1. A composition for providing a scratch resistant, tintable cured coating for a substrate, the composition comprising

(A) a further curable, solvent soluble organopolysiloxane that is a hydrolysis reaction product of methacryloxypropyltrimethoxy silane, ethyl ortho silicate, and water;

(B) phenylphosphonic acid as an additive to part (A) before coating the substrate or used in the hydrolysis as a starting ingredient to obtain the reaction product of (A); and

(C) an organic solvent for (A) and (B), the solution being adapted for coating and curing to form a scratch resistant azo dye tintable cured coating that has improved abrasion resistance and improved tintability.

4,547,398

METHOD FOR MANUFACTURING MAGNETIC RECORDING MEDIUM

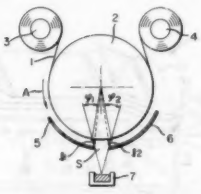
Ryuji Sugita, and Toshiaki Kunieda, both of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 376,234, May 7, 1982, abandoned. This application Nov. 4, 1983, Ser. No. 549,633

Claims priority, application Japan, May 15, 1981, 56-73710; May 19, 1981, 56-76242; Dec. 4, 1981, 56-202215; Feb. 8, 1982, 57-19232

Int. Cl.[4] H01F *10/02*

U.S. Cl. 427—132 4 Claims



1. A method for forming a magnetic recording medium having a magnetic film containing Co and Cr as major constituents and having an axis of easy magnetization normal to a surface thereof, said method comprising vapor depositing vaporized atoms comprising said magnetic film on a substrate travelling through a deposition zone from an entrance to an exit thereof, the angle of incidence of vaporized atoms with respect to a line normal to the film surface at said entrance being not more than 60°, the angle of incidence of the vaporized atoms with respect to said substrate in an intermediate part of said deposition zone being substantially 0°, and the angle of incidence of the vaporized atoms at said exit being larger than the angle of incidence thereof at said entrance.

4,547,399

SEALING COMPOSITION AND METHOD OF MAKING THE SAME

Yoshiki Fujihara, deceased, late of Carpenterville, Ill.; by Hiroko Fujihara, heiress, Burnsville, Minn.; John J. Sackis, Bartlett, and Richard A. Frier, Arlington Heights, both of Ill., assignors to W. R. Meadows, Inc., Elgin, Ill.

Continuation-in-part of Ser. No. 478,811, Mar. 28, 1983, abandoned, which is a continuation of Ser. No. 259,818, May 4, 1981, abandoned. This application Jun. 14, 1984, Ser. No. 620,513

Int. Cl.[4] B22B *35/00;* C08L *9/06, 95/00;* E01C *5/12*

U.S. Cl. 427—138 19 Claims

1. A method of producing a composition capable of sealing cracks, joints and the like in concrete or asphalt, subject to summer temperatures and winter temperatures substantially below zero degrees F., comprising:

heating paving grade asphalt to a temperature above that at which, in a mixture of said asphalt and operative process oil, an SBR rubber is dispersable, said asphalt being sufficient in amount that said SBR rubber is dispersable in said mixture with the amount of asphalt being greater than the total amount of process oil, and the total amount of process oil being in excess of the SBR rubber, but not in excess of 32% by weight of the total ingredients, each by weight;

adding a sufficient amount of operative process oil to said asphalt that said SBR rubber, in particulate form, is dispersable in said mixture;

maintaining the temperature of said mixture at or above said temperature at which said SBR rubber is dispersable;

adding in increments particulate SBR rubber to said asphalt and process oil while heating and stirring said mixture;

adding the remainder of the process oil; and

continuing heating and stirring the mixture until the mixture has a smooth appearance.

5. A method as defined in claim 1, including:

packaging said composition and permitting it to cool and to solidify;

reheating said composition to a temperature of around 380° F. to 400° F.; and

applying said reheated composition to a crack, joint and the like.

4,547,400

METHOD OF MAKING INFRARED REFLECTIVE GLASS SHEET-I

Daryl J. Middleton, Nashville, Tenn., and Jodyne I. Grenier, Noblesville, Ind., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 25, 1985, Ser. No. 705,295

Int. Cl.[4] C03C *17/22*

U.S. Cl. 427—160 6 Claims

1. A method of making an infrared reflective glass sheet which comprises the steps of:

selecting a glass sheet formed of soda/lime silica glass;

heating said glass sheet to a temperature in a range from 900° to 1100° F.;

applying to a surface of said glass sheet a metallic oxide seal coating which does not form sodium chloride crystals which cause the visual appearance of the film to be hazy;

applying to said metal oxide seal coating a coating of tin oxide formed from the decomposition of butyltin trichloride doped with fluoride;

cooling said glass sheet to room temperature after application of said metal oxide seal coating and said tin oxide coating thereon.

4,547,401

CLEANING OF SURFACE OF AN OBJECT

Jack Shore, 4293 Coleridge St., Pittsburgh, Pa. 15201

Filed Apr. 23, 1984, Ser. No. 602,980

Int. Cl.[4] B05B *5/00;* A45B *25/00;* C09K *11/06*

U.S. Cl. 427—161 12 Claims

1. A method of cleaning a surface of an object which comprises subjecting said surface to a detergent solution, thereafter rinsing said surface with a liquid, thereafter subjecting said surface to a beading material to convert the liquid on said surface into beads, and thereafter subjecting said surface to a blast of gas to remove said beads, the said method being characterized by the step of both improving the appearance of the cleaned surface and accelerating the beading by including a small but effective quantity of an optical brightener in one or more of the detergent solution, the rinsing liquid and/or the beading material.

4,547,402

METHOD OF INCREASING THE THERMAL SHOCK RESISTANCE OF PHOSPHATE LASER GLASS

Sadahiro Nakajima; Chiemi Kanamori, and Hisayoshi Toratani, all of Tokyo, Japan, assignors to Hoya Corporation, Tokyo, Japan

Filed Nov. 20, 1984, Ser. No. 673,403

Claims priority, application Japan, Dec. 19, 1983, 58-237760

Int. Cl.[4] B05D *1/18, 3/02;* C03C *17/02;* G02B *1/10*

U.S. Cl. 427—169 7 Claims

1. A method of increasing the thermal shock resistance of a phosphate laser glass which comprises coating the surface of the phosphate laser glass with a sol solution which is prepared by hydrolyzing at least one organometallic compound dissolved in an organic solvent and then partially polycondensing and heat treating the thus-formed coating film to form a glassy coating on the surface of the phosphate laser glass.

4,547,403

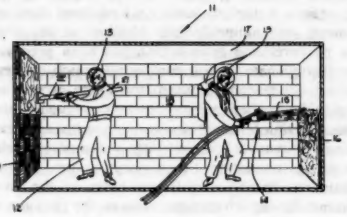
METHOD FOR APPLYING A LAYER OF FIBER ON A SURFACE

William H. Smith, McMurray, Pa., assignor to Manville Service Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 542,272, Oct. 17, 1983, abandoned. This application Oct. 12, 1984, Ser. No. 660,206

Int. Cl.⁴ B05D *1/02, 1/34, 1/36*

U.S. Cl. 427—196 **32 Claims**



1. A method for applying a layer of refractory fibers to a surface comprising the steps of:

directing a stream of said fibers toward said surface;

coating said directed fibers with a tacky inorganic liquid binder during said step of directing such that said fibers adhere to one another and to said surface; and

curing said coated fibers.

4,547,404

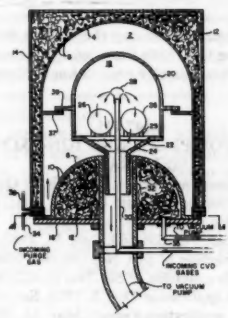
CHEMICAL VAPOR DEPOSITION PROCESS

Bryant A. Campbell, Los Gatos, and Nicholas E. Miller, Cupertino, both of Calif., assignors to Anicon, Inc., San Jose, Calif.

Division of Ser. No. 412,237, Aug. 27, 1982,. This application Oct. 2, 1984, Ser. No. 657,313

Int. Cl.⁴ C23C *11/00*

U.S. Cl. 427—248.1 **4 Claims**



1. A process for controlled temperature chemical vapor deposition on the surfaces of a plurality of vertically oriented substrates in a controlled temperature reaction zone having a temperature of from 250° to 1300° C. and a pressure of lees than 750 mm Hg and contained within the walls of a surrounding, inner reaction chamber, the inner reaction chamber walls being composed of material substantially transparent to radiation, comprising contacting the surfaces with reactant gases, the inner deposition reaction chamber being surrounded by a vacuum chamber housing spaced from the walls thereof, the vacuum chamber housing being substantially surrounded by radiant heating means, the temperature differences throughout the reaction zone being less than 2° C. from preselected temperatures, gas flow from the inner deposition reaction chamber into the space between the walls thereof and the vacuum chamber housing being prevented by the walls of the inner vacuum deposition reaction chamber, whereby deposition on the vacuum chamber housing is reduced.

4,547,405

INK JET TRANSPARENCY

Stanley F. Bedell, Andover, and Michael S. Viola, Burlington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 13, 1984, Ser. No. 681,205

Int. Cl.⁴ B41M *5/00*

U.S. Cl. 427—256 **12 Claims**

1. An ink jet recording sheet comprising a transparent support carrying a layer comprising 5–100% of a coalesced block copolymer latex of polyvinyl alcohol and polyvinyl (benzyl ammonium chloride) and 0–95% by weight of a water-soluble polymer selected from the group consisting of polyvinyl alcohol, and polyvinylpyrrolidone and copolymers thereof.

4,547,406

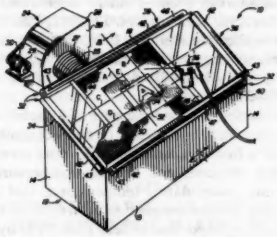
METHOD FOR PRINTING INDICIA ON POROUS SHEETS

Joe W. Armstrong, 1229 E. Highland, Phoenix, Ariz. 85014

Filed Mar. 17, 1983, Ser. No. 476,120

Int. Cl.⁴ B05D *5/00, 1/32, 3/12*

U.S. Cl. 427—282 **6 Claims**



1. A method for printing indicia on a porous sheet comprising the steps of:

(a) producing a negative static pressure within an enclosure which has a perforated work surface to produce an air flow into said enclosure through said perforated work surface;

(b) placing a thin lightweight porous sheet to be printed on said perforated work surface so that the suction produced by the negative static pressure will hold said porous sheet in firm contiguous engagement therewith;

(c) arranging an imperforate stencil sheet having indicia representing cutouts therein on said porous sheet so that the suction produced by the negative static pressure will act through the pores of said porous sheet to firmly hold said stencil sheet in contiguous overlaying relationship therewith;

(d) masking at least the areas of said perforated work surface which remain uncovered after said porous sheet and said stencil sheet are in place on said perforated work surface to block the air flow through those uncovered areas; and

(e) applying a liquid printing medium on the areas of said porous sheet which are exposed through the indicia representing cutouts of said stencil sheet.

4,547,407

ELECTROLESS METAL COATINGS INCORPORATING PARTICULATE MATTER OF VARIED NOMINAL SIZES

Robert A. Spencer, Jr., Wilmington, N.C., assignor to Surface Technology, Inc., Princeton, N.J.

Continuation of Ser. No. 406,548, Aug. 9, 1982, abandoned, which is a continuation-in-part of Ser. No. 280,830, Jun. 30, 1981, abandoned, which is a division of Ser. No. 201,305, Oct. 27, 1980, abandoned. This application Oct. 11, 1983, Ser. No. 540,303

Int. Cl.[4] C23C *3/02*

U.S. Cl. 427—367 25 Claims

1. In a process of the electroless metallization of a substrate comprising contacting said substrate with an electroless plating bath to deposit a metallic layer on the surface of said substrate, said plating bath comprising a metal salt, an electroless reducing agent thereof, and a quantity of finely divided insoluble particulate matter, said particulate matter being suspended in said plating bath, and thereafter smoothing the surface of said metallic layer thereby decreasing the surface roughness of said metallic layer, the improvement comprising utilizing as the particulate matter an admixture of one chemical substance having at least two distinct sizes of particulate matter, at least one of said sizes being relatively larger than at least one of said other sizes, such that the amount of energy required to smooth the surface of said metallic layer is reduced in comparison with the amount of energy normally required to smooth surfaces formed by the same general process, but using primarily only the larger size of particulate matter and furthermore wherein the relative ratio for the large size to the small size is less than 10:1.

4,547,408

METAL-CLAD LAMINATE ADAPTED FOR PRINTED CIRCUITS

Robert Cassat, Ternay, and Bruno Vignando, Saint-Fons, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Division of Ser. No. 314,014, Oct. 22, 1981, Pat. No. 4,456,657. This application Apr. 13, 1984, Ser. No. 599,988

Claims priority, application France, Dec. 5, 1980, 80 23943

Int. Cl.[4] B05D *3/02;* B32B *15/06*

U.S. Cl. 427—375 14 Claims

1. A process for the manufacture of a metallized substrate comprising successively stacking: (i) an electrically conducting metal foil; (ii) a first skin laminae; (iii) a core member; and (iv) a second skin laminae; and thence compressing said stack under substrate consolidating temperatures, said core member (iii) comprising a major proportion by weight of a cellulosic or mica filler and a proportion of less than 40% by weight of a thermosetting resin which is a polyimide resin or a mixture of polyimide resin and epoxy resin, said central core (iii) being prepared by papermaking technique, and skin laminae (ii) and (iv) each consisting of a fibrous glass, asbestos or heat-stable synthetic polymer reinforcing filler, and a thermosetting resin impregnant, which thermosetting resin may either be the same or different from the thermosetting resin comprising said core member (iii).

4,547,409

SELF-CROSSLINKING HEAT-CURABLE BINDER

Michael Geist, Münster, and Horst Diëfenbach, Nottuln, both of Fed. Rep. of Germany, assignors to BASF Farben & Fasenn A.G., Hamburg, Fed. Rep. of Germany

Division of Ser. No. 472,639, Mar. 7, 1983, Pat. No. 4,495,335. This application Oct. 2, 1984, Ser. No. 657,062

The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.

Int. Cl.[4] C08L *67/04*

U.S. Cl. 427—386 5 Claims

1. Electrocoating baths for electrocoating processes containing a self-cross-linking heat-curable binder based on an organic synthetic resin which contains amino groups and esterified carboxyl groups and is water-dilutable due to neutralization with acids, in which the esterified carboxyl groups are activated in the alcohol component and are β-hydroxylalkyl ester groups or carbalkoxymethyl ester groups and said organic synthetic resin is an epoxy resin which has been prepared by reacting a polyglycidyl ester or ester with a compound which carries two groups which are reactive toward epoxy groups and at least one of said esterified carboxyl groups to give an intermediate product having terminal epoxy groups, and reacting said terminal epoxy groups having open rings with a compound selected from the group consisting of primary amines, secondary amines, ketimines having a hydrogen atom on the nitrogen atom, and aminoalcohols blocked at the nitrogen atom or a polyurethane resin which has been prepared by reacting a diisocyanate with a compound which carries two groups which are reactive toward isocyanate groups and at least one of said esterified carboxyl groups to give an intermediate product having terminal isocyanate groups, and reacting said terminal isocyanate groups with a compound selected from the group consisting of primary amines, secondary amines, ketimines having a hydrogen atom on the nitrogen atom, aldimines having a hydrogen atom on the nitrogen atom, and aminoalcohols blocked at the nitrogen atom.

4,547,410

PROCESS FOR APPLYING A MULTI-LAYER PAINT CONTAINING MICA PIGMENT

Sol Panush, Farmington Hills; James M. Gelmini, Warren, and David M. Varcak, Detroit, all of Mich., assignors to Inmont Corporation, Clifton, N.J.

Filed Dec. 21, 1983, Ser. No. 563,831

Int. Cl.[4] B05D *1/02*

U.S. Cl. 427—388.2 9 Claims

1. The method of applying a thermoplastic or thermosetting coating to the surface of an article, wherein the coating is formed from a liquid containing a polymer, a volatile solvent and very fine ceramic pigment platelets, which comprises atomizing the liquid to form droplets and impacting the droplets onto the surface at a rate sufficient to form a continuous liquid layer but insufficient to cause the liquid to flow across the surface, the layer having a thickness greater in dimension than the nominal maximum length of the ceramic pigment platelet lengths; and, volatilizing the solvent from the liquid layer to harden the layer into the coating, to thereby produce an essentially random platelet orientation in the coating.

4,547,411

PROCESS FOR PREPARING ION-EXCHANGE MEMBRANES

Jean Bachot, Fontenay aux Roses; Jean-Pierre Quentin, Lyons, and Jean-Luc Bourgeois, Tassin la Demi Lune, all of France, assignors to Chloe Chimie, Paris, France

Continuation of Ser. No. 339,669, Jan. 15, 1982, abandoned, which is a continuation of Ser. No. 130,090, Mar. 13, 1980, abandoned, which is a division of Ser. No. 19,822, Mar. 12, 1979, abandoned. This application Oct. 3, 1983, Ser. No. 538,473

Claims priority, application France, Mar. 14, 1978, 78 08066; Dec. 13, 1978, 78 35034

Int. Cl.[4] B05D *3/02, 7/02*

U.S. Cl. 427—393.5 2 Claims

1. A process for preparing ion-exchange membranes suitable for use in electrolysis, which process comprises impregnating a porous sheet comprising a polyfluoroolefin, asbestos fibers and an inorganic pore-forming agent, with a solution comprising (i) a compound selected from the group consisting of acrylic acid and methacrylic acid and (ii) at least one other non-ionic monomer having at least one $>C=CH_2$ group, withdrawing said sheet from contact with said solution, polymerizing the monomers which become impregnated in said sheet so that the pores of the sheet contain the resulting acrylic polymer, eliminating said inorganic pore-forming agent to form pores in said sheet and swelling the acrylic polymer so that the pores of the sheet are closed by the polymer.

4,547,412

HEATING FOAM CONTAINER IN UNRESTRICTED STATE TO INCREASE STIFFNESS

Daniel J. Schneider, Cadott, Wis., and Jeffrey S. Reiter, Los Altos Hills, Calif., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 11, 1983, Ser. No. 540,318
Int. Cl.[4] B65D *11/20;* B32B *31/26*
U.S. Cl. 428—35 8 Claims

1. A method for providing a finished polystyrene foam container having a sidewall and a bottom, said container having improved stiffness and being suitable for use with hot beverages, said method comprising:

(1) forming a container from a laminate of polystyrene foam and, on at least the outer surface thereof, a layer of solid polystyrene by rolling said laminate into shape to form the side wall and subsequently sealing the bottom of the container to the sidewall, and

(2) heating said container in an unrestrained state at a temperature sufficient to increase the thickness of the sidewall at least 10 percent and form the finished container which is then stacked prior to use.

4. A container produced by the process of claim 1.

4,547,413

SHRINKABLE FILM FOR POULTRY BAGS

Stanley Lustig, Park Forest; Jeffrey M. Schuetz, Downers Grove, and Stephen J. Vicik, Darien, all of Ill., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 445,941, Dec. 1, 1982, Pat. No. 4,447,480. This application Jun. 27, 1984, Ser. No. 624,952
The portion of the term of this patent subsequent to May 8, 2001, has been disclaimed.
Int. Cl.[4] A21D *10/02;* C08L *23/04;* B65D *33/00*
U.S. Cl. 428—35 33 Claims

1. A heat-shrinkable film, suitable for used in fabricating bags for packaging frozen poultry, comprising a mixture of between about 75 and about 95 percent by weight, based on the weight of said film, of an ethylene-vinyl acetate copolymer having a vinyl acetate content of from at least about 1.7 to about 5.0 percent by weight, based on the weight of said ethylene-vinyl acetate copolymer, and having a melt index of from at least about 0.15 to about 0.35 decigram per minute; and between about 5 and about 25 percent by weight, based on the weight of said film, of a polyethylene material selected from the group consisting of:

(a) low pressure-high density polyethylene having a melt index of between about 0.15 and about 0.70 decigram per minute, and a density of between about 0.94 and about 0.96 gram per cubic centimeter, and

(b) low pressure-low density polyethylene having a melt index of between about 0.3 and about 3.0 decigrams per minute, and a density of between about 0.915 and about 0.925 gram per cubic centimeter.

4,547,414

ROOM TEMPERATURE SHRINKABLE COATING MATERIAL

Kanemitsu Eguchi, Aichi, Japan, assignor to Kitagawa Industries Co., Ltd., Nagoya, Japan

Filed Sep. 1, 1983, Ser. No. 528,444
Int. Cl.[4] B32B *27/04*
U.S. Cl. 428—36 7 Claims

1. A covering material capable of shrinking at room temperature onto the surface of a substrate to produce a tight sealing thereof, made of a high molecular weight polymer impregnated with a volatile swelling agent and at least one non-volatile agent selected from the group consisting of:

rust-preventing agents,
weathering agents,
rodent repellents,
flame retardants,
dust-proofing agents,
antistatic agents,
adhesives,
tinting agents and
antiaging agents

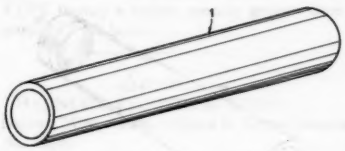
wherein the non-volatile agent is soluble and homogeneously dispersible in the volatile swelling agent and in the polymer at room temperature.

4,547,415

BINDERLESS CERAMIC OR CERAMIC OXIDE HOLLOW BODY AND METHOD FOR ITS MANUFACTURE

Werner Schultze, Bonn, and Knut Weber, Jr., Wiehl, both of Fed. Rep. of Germany, assignors to Vereinigte Aluminium-Werke Aktiengesellschaft and Langlet, Weber KG, both of, Fed. Rep. of Germany

Division of Ser. No. 225,191, Jan. 15, 1981, Pat. No. 4,460,529. This application Sep. 27, 1983, Ser. No. 510,876
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1980, 3001371
Int. Cl.[4] B07D *7/22, 1/36;* B05D *3/02*
U.S. Cl. 428—36 5 Claims



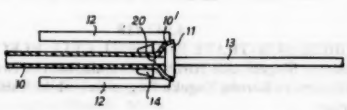
1. A hollow tubular body comprising layers of fused particles, said particles being selected from the group consisting of ceramic and ceramic oxide particles, said particles being free of any binding agent, said body being porous, free of internal adhering supports, and said body having been produced under temperature conditions such that the temperature gradient to which said layers are subjected does not exceed 2° C./mm of layer thickness.

4,547,416

THERMOPLASTICS ARTICLES AND METHOD AND APPARATUS FOR MAKING THEM

Leonard W. Reed, Wantage; Robert M. S. Barr, Faringdon, and David A. Dick, Wantage, all of England, assignors to Metal Box Limited, England

Division of Ser. No. 322,380, Nov. 17, 1981, Pat. No. 4,447,199. This application Mar. 7, 1984, Ser. No. 574,615
Claims priority, application United Kingdom, Nov. 19, 1980, 8037137
Int. Cl.[4] B29C *17/07*
U.S. Cl. 428—36 22 Claims



1. An at least partly biaxially oriented tubular article formed from an elongate tube of thermoplastics material by a process which comprises performing a cycle of operations which includes the following steps:

engaging the tube by a first clamping means over a first region at a leading end of the tube and engaging the tube by a second clamping means over a second region at a

trailing end of the tube at a spacing from the first region so as to define between the clamping regions a portion of the tube to be longitudinally stretched and radially expanded;

moving the clamping means apart to stretch the tube portion longitudinally and admitting pressure fluid to the tube portion to expand it radially, such stretching and expansion forming a bubble of biaxially oriented thermoplastics material between the leading and trailing ends of the tube; and

severing a substantial part but not all of the bubble from the tube to form the tube with a new flared end at the said trailing end of the tube which becomes in turn a new leading end of the tube.

4,547,417

CORE PLUG

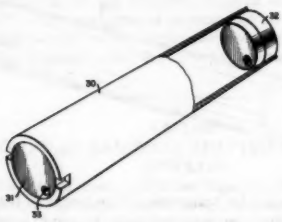
Richard E. DeMarco, Waldwick, N.J.; David Hopkins, Wilton, and Dennis I. Deegan, Fairfield, both of Conn., assignors to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 270,413, Jan. 4, 1981, abandoned. This application Oct. 13, 1983, Ser. No. 541,696

The portion of the term of this patent subsequent to Nov. 27, 2001, has been disclaimed.

Int. Cl.[4] B65D *85/67*

U.S. Cl. 428—64 **4 Claims**



1. A core plug for reinforcing and preventing damage to the ends of hollow tubular cores during shipment, said core plug comprising a solid, elongated cylindrical body with an integral tapered forward portion, formed from wood, plastic or a composite woody material having sufficient strength to absorb the impact shocks and crushing loads experienced by the cores during shipping and handling, said core plug being inserted into the ends of the cores prior to shipment, said core plug including a core plug removal opening spaced from the center thereof which extends for the full length of said cylindrical body and said integral tapered forward portion, said opening being located within the outer one-half of the radius of the cylindrical body of the plug and arranged so that the edge thereof closest to the center of the core plug is spaced from the center of the core plug by a distance equal to or greater than about one-half the radius of the cylindrical body portion for providing increased strength to the core plug, said opening being adapted to accomodate a removal tool for removing the core plug after shipment.

4,547,418

RIBBED SUBSTRATE FOR FUEL CELL ELECTRODE

Masatomo Shigeta, and Hiroyuki Fukuda, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1983, Ser. No. 523,661

Claims priority, application Japan, Aug. 24, 1982, 57-146691

Int. Cl.[4] B32B *3/30, 33/00*

U.S. Cl. 428—167 **3 Claims**

1. A ribbed porous substrate for a fuel cell electrode, havinga bending strength of not less than 50 kg/cm^2 and a porosity of 50–80%, not less than 70% of pores being open pores and not less than 60% of the pores having a diameter in the range of 5–50 μm, which comprises a double layer structure consisting essentially of a ribbed layer having ribs on one side thereof and a non-ribbed layer having flat surface on both sides thereof and having a bulk density lower than the bulk density of the ribbed layer, the non-ribbed layer being laminated onto a flat surface of said ribbed layer and the laminated sheet being calcinated.

4,547,419

MAGNETIC RECORDING MEDIUM

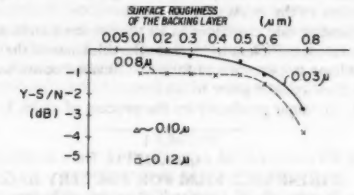
Masaharu Nishimatsu, Komoro; Toshiaki Ide; Hiroyuki Arioka, both of Saku, and Yuichi Kubota, Komoro, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jul. 18, 1984, Ser. No. 632,115

Claims priority, application Japan, Aug. 18, 1983, 58-149655

Int. Cl.[4] G11B *5/72*

U.S. Cl. 428—212 **2 Claims**



1. A magnetic recording medium which comprises a plastic base film and a magnetic layer formed on one side of the base film and composed of a ferromagnetic alloy powder dispersed in a resin binder, characterized in that said ferromagnetic alloy powder has a surface area of at least 48 m^2/g as measured by BET method, said magnetic layer has a coercive force of at least 1,000 Oe and a surface roughness of at most 0.08 μm, and a radiation-cured backing layer made of a radiation sensitive resin and having a surface roughness of from 0.05 to 0.6 μm is formed on the other side of the base film.

4,547,420

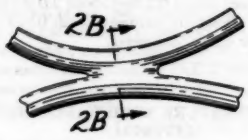
BICOMPONENT FIBERS AND WEBS MADE THEREFROM

Dennis L. Krueger, Hudson, Wis., and Daniel E. Meyer, Stillwater, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 11, 1983, Ser. No. 540,544

Int. Cl.[4] D03D *3/00*; D02G *3/00*

U.S. Cl. 428—229 **11 Claims**



1. A fibrous web comprising bicomponent fibers that individually comprise a first polymeric material extending longitudinally along the fiber through a first portion of the cross-sectional area of the fiber and a second polymeric material extending longitudinally along the fiber through a second portion of the cross-sectional area of the fiber; the first polymeric material being of amorphous form but undergoing a crystallization at a temperature less than the melting temperature of the second polymeric material which causes the bicomponent fibers to retain the shape they assume during crystallization, whereby the web can be molded to a fibrous shape-retaining form.

4,547,421

HIGHLY DISPERSED CONTINUOUS GLASS FIBER MATS

Sidney G. Dunbar, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 22, 1984, Ser. No. 663,272
Int. Cl.[4] B32B *31/08*
U.S. Cl. 428—285 20 Claims

1. A fibrous mat comprising a plurality of layers wherein at least one of the layers is comprised of a plurality of bundles of continuous glass filaments intersecting one another defining open sections therein, the number of intersections of said bundles being within the range from about 60 to about 210 intersections per mm^2, the area of said open sections being within the range from about 3.4×10^2 to about 4.0×10^4 μm^2.

4,547,422

FABRIC REINFORCED MULTIPLE PLY CONVEYOR BELT

Brian H. Oliver; Harold A. Blinn, and Robert I. Carvalho, all of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 12, 1982, Ser. No. 367,208
Int. Cl.[4] B65G *15/34, 15/38*
U.S. Cl. 428—286 4 Claims

1. A plied up belt capable of passing the U.K. National Coal Board Specification [NCB158] for underground belting including laminated plies of coated fabric, said coated fabric being formed by calendering a fused blend of 100 parts of polyvinyl chloride and 10 to 30 parts of acrylonitrile/butadiene rubber containing 18 to 67 percent acrylonitrile which contains no amino acid curative on to said fabric.

4,547,423

TEXTILE FOR CLOTHES

Akira Kojima, Machida; Saburo Yoshida, Atsugi; Yoshio Yamada; Seiji Shioda, both of Fukui, and Kazumi Isoshima, Ootsu, all of Japan, assignors to Sony Corporation; Seiren Co., Ltd. and Asahi Kasei Kogyo Kabushiki Kaisha, all of, Japan

Filed Jul. 14, 1983, Ser. No. 513,690
Claims priority, application Japan, Jul. 15, 1982, 57-123490
Int. Cl.[4] B32B *3/26, 5/18*
U.S. Cl. 428—315.5 11 Claims

1. A material for clothes comprising:
a base cloth; and
a porous film having a number of very fine pores and formed on at least one surface of said base cloth, said pores being made to have a diameter about 0.1 to 5 μm, said material having a percentage of dust permeation less than 50% for a dust with a size larger than 0.3 μm, a moisture permeability more than 2500 $g/m^2/24$ hrs, and having means incorporated therein for preventing said material from being electrically charged.

4,547,424

COMPRESSION RESISTANT EXPANDED, POROUS POLYTETRAFLUOROETHYLENE COMPOSITE

Hirosuke Suzuki, Tokorozawa, Japan, assignor to Junkosha Company, Ltd., Tokyo, Japan

Filed Apr. 1, 1985, Ser. No. 718,729
Claims priority, application Japan, Apr. 10, 1984, 59-72473
Int. Cl.[4] B32B *5/22, 5/26, 5/30*
U.S. Cl. 428—316.6 5 Claims

1. A composite article comprising a layer of expanded, porous PTFE maintained in a fully stretched state and bonded in laminar contact to a substrate layer which prevents shrinkage of the PTFE layer and provides high compression resistance to said PTFE layer.

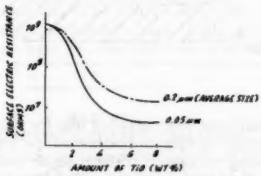
4. The composite of claim 1 wherein said substrate is a layer of porous PTFE having a higher specific gravity than said expanded, porous PTFE layer.

4,547,425

MAGNETIC RECORDING MEDIA

Tsunehide Naruse, Mito, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Jul. 18, 1983, Ser. No. 514,795
Claims priority, application Japan, Jul. 20, 1982, 57-125154
Int. Cl.[4] G11B *5/68, 5/70*
U.S. Cl. 428—328 5 Claims



1. A magnetic recording medium comprising a substrate, and a recording layer formed on at least one side of the substrate and made of magnetic particles selected from the group consisting of ferromagnetic metal oxide particles and ferromagnetic metal particles and from 0.15 to 35 wt %, based on said magnetic particles, of a non-magnetic powder consisting essentially of TiO powder having an average particle size of from 0.015 to 5.0 microns, both of said magnetic particles and said TiO powder being dispersed throughout a resin binder.

4,547,426

UPHOLSTERY WELT CORD

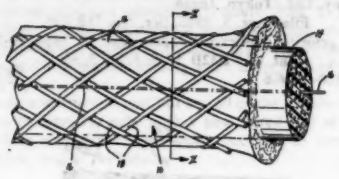
Robert E. Montle, Wyoming, Mich., assignor to Sackner Products, Inc., Grand Rapids, Mich.

Filed Feb. 25, 1985, Ser. No. 705,360
Int. Cl.[4] D02G *3/00;* D04C *1/02, 1/06*
U.S. Cl. 428—377 6 Claims

1. A fire resistant welt cord for upholstery, comprising:
a core made of a flexible polymeric materjal and extruded in cylindrical cross section;
a cover made of crepe sheets of cellulose wadding and surrounding said core;

a jacket of threads wrapped around said body and holding said cover on said core; and

a filament made of a heat conductive material located within said core and extending the longitudinal length of said



core; whereby a point source of heat placed against said cord will be dissipated by said filament conducting heat away from said point source, said core will maintain the shape of said core when bent around corners and said cover provides a softness to touch.

4,547,427

MULTILAYER, STERILIZABLE DEEP-DRAWING FILM

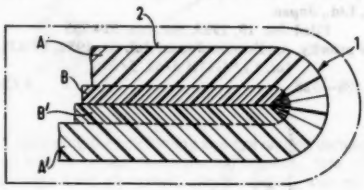
Herbert Engelsberger, Viersen, Fed. Rep. of Germany, assignor to Feldmühle Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Apr. 18, 1984, Ser. No. 601,554

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1983, 3315582; Apr. 29, 1983, 3315652

Int. Cl.⁴ B32B *27/08*; B65D *1/34*

U.S. Cl. 428—349 **20 Claims**



1. A multilayer deep-drawing film for use in low temperature resistant vacuum deep-drawing packaging or vacuum deep-drawing packaging of sharp edged packed goods, comprising a four layer composite film produced by flattening upon itself, a two layer coextruded blown tube, the outer layer of said tube being linear polyethylene or high density polyethylene, and the inner layer of said tube being ethylene methacrylic acid copolymer crosslinked with metal ions or an ethylene vinylacetate copolymer, said outer layer and said inner layer of said tube being secured to one another by melt-bonding, whereas the surfaces of said inner layer are coextensively secured to one another by a mechanical, detachable heat-bonding, said heat-bonding being achieved by flattening said tube and contacting said surfaces under the influence of heat and pressure.

4,547,428

TERPOLYMER PROCESSING AID FOR POLYVINYL HALIDE POLYMERS

Vladimir Bekker, St. Louis; Wayne J. Buchheim, Ballwin; William Vanderlinde, Creve Court, and Donald S. T. Wang, St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 21, 1983, Ser. No. 477,694

Int. Cl.⁴ C08L *33/00*; B32B *5/16, 27/14*

U.S. Cl. 428—402 **28 Claims**

1. A granular processing aid adapted to be reduced to a powder and blended with a vinyl halide polymer to produce a composition having superior mechanical processing properties, the granules thereof comprising agglomerates of a particulate terpolymer, said terpolymer having a molecular weight of at least about 100,000 (weight average), as measured by gel permeation chromatography and a glass transition temperature of between about 60° C. and about 100° C., and being adapted for use as a processing aid for a vinyl halide polymer, said terpolymer comprising between about 30% and about 90% by weight of repeating units derived from an olefin, between about 1% and about 30% by weight of diester repeating units derived from a diester of an addition polymerizable unsaturated dicarboxylic aid, and between about 1% and about 40% by weight of repeating units derived from a solubilizing monomer which promotes compatibility of the terpolymer with a vinyl halide polymer, said agglomerates having a particle size of between about 1/64" (0.4 mm) and about 1/16" (1.6 mm).

4,547,429

ENCAPSULATED SALTS OF ACID PARTICLES WHEREIN THE SALT PARTICLES ARE SURROUNDED BY A POLYURETHANE/POLYUREA CASING

Ulrich Greiner, Schöneck; Karl-Heinz Keil, Hanau-Mittelbuchen; Rudolf Heinrich, and Konrad Albrecht, both of Kelkheim, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 6, 1984, Ser. No. 648,123

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3333654

Int. Cl.⁴ B01J *13/02*

U.S. Cl. 428—402.24 **6 Claims**

1. Encapsulated particles of hydrofluoric acid salts, hydrofluoric acid complexes or hydrocyanic acid salts having sparing solubility in water wherein the particles are surrounded by a pressure-resistant, elastic, abrasion resistant polyurethane/polyurea casing, the ratio by weight of particles to the polyurethane component of the casing material being 1:0.2 to 1:2.5.

4,547,430

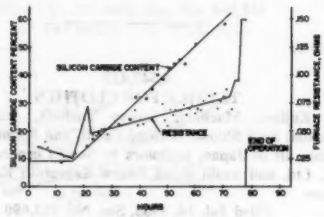
ULTRA-MICROCRYSTALLITE SILICON CARBIDE PRODUCT

William M. Goldberger, and Allen K. Reed, both of Chicago, Ill., assignors to Superior Graphite Company, Chicago, Ill.

Filed Nov. 10, 1981, Ser. No. 319,976

Int. Cl.⁴ B32B *9/00*

U.S. Cl. 428—404 **8 Claims**



EFFECT OF SILICON CARBIDE CONTENT ON FURNACE RESISTANCE

1. A silicon carbide and carbon composition comprising:

free-flowing granular particles, said particles including

a carbon body having a surface containing a multiplicity of pores extending into the interior of the carbon body for a substantial distance relative to the diameter of said carbon body; and

ultra-microcrystallites of beta form silicon carbide disposed on and substantially covering the surface of said carbon

body and disposed within and lining the walls of the pores of said carbon body.

4,547,431

ULTRAVIOLET RADIATION-CURABLE SILICONE CONTROLLED RELEASE COMPOSITIONS

Richard P. Eckberg, Roundlake, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jun. 20, 1983, Ser. No. 505,756
Int. Cl.[4] C08F *2/50*; B23B *27/16*
U.S. Cl. 428—413 **17 Claims**

1. An ultraviolet radiation-curable controlled release composition comprising:

(A) an epoxyfunctional diorganopolysiloxane comprising units of the formula $RR'SiO$, wherein R is hydrogen or $C_{(1-8)}$ alkyl and R' is R or a monovalent epoxyfunctional organic radical of from 2 to 20 carbon atoms, said diorganopolysiloxane having up to about 20% by weight epoxyfunctional groups and a viscosity of from about 50 centipoise to 200,000 centipoise at 25° C.;

(B) a catalytic amount of a photocatalyst or a combination of photocatalysts; and

(C) a small amount of epoxy monomer having two or more epoxy groups or a combination of epoxy monomers having two or more epoxy groups effective to raise the release of the cured controlled release composition.

4,547,432

METHOD OF BONDING SILVER TO GLASS AND MIRRORS PRODUCED ACCORDING TO THIS METHOD

John R. Pitts, Golden; Terence M. Thomas, Arvada, and Alvin W. Czanderna, Lakewood, all of Colo., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 31, 1984, Ser. No. 636,511
Int. Cl.[4] B32B *9/04*
U.S. Cl. 428—448 **17 Claims**

14. A silvered-glass mirror capable of providing protection against moisture and other forms of environmental weathering having a structure fabricated by a process comprising the steps of:

placing a polymer substrate in an evacuated chamber;

depositing a layer of transparent metal oxide on a surface of the polymer substrate;

enriching the exposed surface of the metal oxide layer with silicon atoms;

depositing a silver layer on the silicon-enriched surface of the metal oxide layer;

depositing a metal oxide layer over the exposed surface of the silver layer;

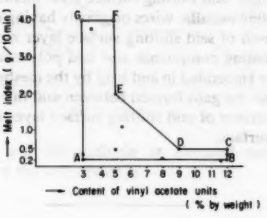
removing this composite structure of metal oxide and silver layers bonded to the polymer substrate from the evacuated chamber and encapsulating the composite structure, including the interface edges of all said layers with each other and with the substrate with a dissolved polymer in liquid form, and allowing the solvent to evaporate, leaving a hardened polymer shell that hermetically seals the metal oxide and silver layers and the layer-to-substrate interface edges from the atmosphere.

4,547,433

HEAT-SHRINKABLE LAMINATE FILM

Masaki Ohya; Yoshiharu Nishimoto, and Kengo Yamazaki, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 5, 1982, Ser. No. 439,582
Claims priority, application Japan, Nov. 11, 1981, 56-180734
Int. Cl.[4] B32B *27/08, 33/00, 7/02*; B65B *11/00*
U.S. Cl. 428—516 **7 Claims**



1. A heat-shrinkable laminated film excellent in gas-barrier property and oil-resistance and heat-sealing resistance, comprising:

a core layer of a gas-barrier resin which is a copolymer of vinylidene chloride or a copolymer of ethylene and vinyl alcohol, an outer layer (A) of a resin which is a copolymer (I) of ethylene and an alpha-olefin of 4 to 18 carbon atoms and having a specific gravity of 0.900 to 0.950 and a crystal melting point of 110° to 130° C. or a mixture of more than 20% by weight of the copolymer (I) and less than 80% by weight of a copolymer (II) of ethylene and vinyl acetate having a crystal melting point of 80° to 103° C., another outer layer (B) of a resin which is a cross-linked material formed from a polymer selected from the group consisting of the copolymer (I), the copolymer (II) and a mixture of the copolymer (I) and the copolymer (II) by exposing the polymer to an ionizing irradiation, and two adhesive layers each adhesive layer being disposed between the core layer and one of the outer layers (A) and (B).

4,547,434

HEAT-RESISTANT SHIFT MEMBER

Kikuo Sumiyoshi; Eiji Sato; Masamitsu Kojima, all of Fujisawa; Masayoshi Izumi, and Kingo Miyasaka, both of Ayase, all of Japan, assignors to Oiles Industry Co., Ltd., Tokyo, Japan

Filed Sep. 4, 1984, Ser. No. 647,147
Claims priority, application Japan, Sep. 9, 1983, 58-165145
Int. Cl.[4] F16J *15/12*
U.S. Cl. 428—609 **3 Claims**

1. A heat-resistant shift member comprising a fundamental body which is formed of one or more compressed heat-resistant materials selected from a group composed of expanded graphite, mica and asbestos with entangled stainless steel wires originally having constituted a metallic mesh being firmly embedded therein, and a shifting surface layer member integrally covering the shifting surface of said fundamental body which is formed of a heat-resistant sheet member composed of

filaments made of one or more of asbestos, carbon (excluding expanded graphite) and glass, one or more of solid lubricating compounds laid thereon, and a polytetrafluoroethylene resin applied on the outer surface thereof so as to partly penetrate into the porous outer surface thereof and to partly form a coating thereon, said heat-resistant sheet member and said solid lubricating compounds being reinforced by a metallic mesh made of fine stainless steel wires by being introduced within said metallic mesh together with said polytetrafluoroethylene resin, whereby said shifting surface layer member is formed of entangled fine metallic wires originally having constituted said metallic mesh of said shifting surface layer member, and said solid lubricating compounds and said polytetrafluoroethylene resin firmly embedded in and held by the meshes of said metallic mesh and the gaps formed between said fine stainless wires, the outer surface of said shifting surface layer member having a smooth surface.

4,547,435

METHOD FOR PREPARING FIBER-REINFORCED METAL COMPOSITE MATERIAL

Kohji Yamatsuta, Ibaraki, and Ken-ichi Nishio, Shiga, both of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Division of Ser. No. 285,975, Jul. 23, 1981, Pat. No. 4,489,138. This application Apr. 17, 1984, Ser. No. 601,282

Claims priority, application Japan, Jul. 30, 1980, 55-105729; Jul. 31, 1980, 55-106154; Apr. 7, 1981, 56-52616; Apr. 7, 1981, 56-52617; Apr. 7, 1981, 56-52618; Apr. 7, 1981, 56-52620; Apr. 7, 1981, 56-52621; Apr. 7, 1981, 56-52623

Int. Cl.⁴ B32F *15/20*

U.S. Cl. 428—614 **12 Claims**

1. A method for preparing a fiber-reinforced metal composite material consisting essentially of:

adding at least one element selected from the group consisting of K, Cs, Rb, Fr, Sr, Ba, Ra and In in an amount of 0.0005 to 10% by weight into molten metal or molten alloy; and

combining the thus prepared matrix containing at least one of said elements with an inorganic fiber reinforcing material to form the fiber-reinforced metal composite material.

4,547,436

CONDUCTIVE ELEMENT METALLIZED WITH A THICK FILM GOLD COMPOSITION

Joseph R. Rellick, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 442,955, Nov. 19, 1982, Pat. No. 4,466,830. This application Apr. 27, 1984, Ser. No. 604,587

Int. Cl.⁴ H01B *1/02, 5/00*

U.S. Cl. 428—672 **3 Claims**

1. A conductive element comprising a conductive metal substrate having a gold layer affixed thereon by screen printing a thick film gold composition containing:

65 to 97% by weight of gold particles,

3 to 25% by weight of particles of an alloy of cadmium and antimony having an antimony content of 25–80% by weight,

0–20% by weight copper particles, and

0–30% by weight silver particles on the metal substrate and thereafter firing and sintering.

4,547,437

PROTECTIVE INTERLAYER FOR HIGH TEMPERATURE SOLID ELECTROLYTE ELECTROCHEMICAL CELLS

Arnold O. Isenberg, Forest Hills Boro; Roswell J. Ruka, Churchill Boro, and Gregory E. Zymboly, Penn Hills Township, Allegheny County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 5, 1984, Ser. No. 657,923

Int. Cl.⁴ H01M *8/12*

U.S. Cl. 429—30 **7 Claims**

1. In a high temperature, solid electrolyte electrochemical cell having two electrodes with solid electrolyte therebetween, where the electrolyte is formed by vapor deposition from metal halides at temperatures over about 1000° C., and said hot metal halide vapors are capable of degrading the electrode materials, the improvement comprising a solid, oxide interlayer material, which is electrically conductive, and oxygen permeable, disposed between at least one of the electrodes and the electrolyte, to protect the electrode from degradation by the hot metal halide vapors where said interlayer material is selected from the group consisting of calcium and cobalt doped yttrium chromite, calcium doped yttrium chromite, and cobalt doped yttrium chromite.

4,547,438

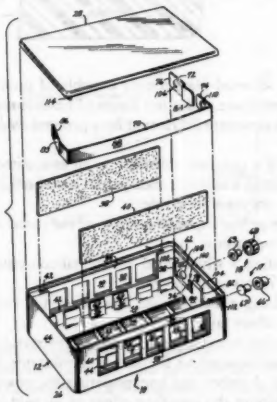
BATTERY ASSEMBLY

William J. McArthur, Maple Grove, Minn., and Roger W. Kelm, New Richmond, Wis., assignors to Duracell Inc., Bethel, Conn.

Filed Dec. 18, 1984, Ser. No. 683,163

Int. Cl.⁴ H01M *2/00*

U.S. Cl. 429—82 **16 Claims**



1. A battery assembly comprising a plurality of gas depolarizable electrochemical cells, each cell having first and second electrodes of opposite polarities and the plurality of cells being stacked electrically in series along a first dimension, a housing

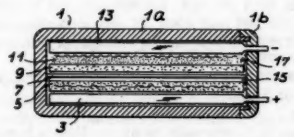
for containing the plurality of cells, the housing including means for ventilating the interior of the housing and further including first and second opposite walls perpendicular to the first dimension, the stack of cells being arranged within the housing with the first electrode of the initial cell of the stack facing the first wall and the second electrode of the final cell of the stack facing the second wall, first and second electrically conductive connectors disposed within the housing, the first connector including first end means electrically coupled to the first electrode of the initial cell and second end means disposed adjacent the first wall and the second connector including first end means electrically coupled to the second electrode of the final cell and second end means disposed adjacent the first wall, and first and second electrically conductive terminal means electrically coupled to the second end means of the first and second connectors, respectively, and extending through the first wall to the exterior of the housing.

4,547,439

ELECTROCHEMICAL GENERATOR

Eugène Geniès, St. Egreve, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 29, 1983, Ser. No. 527,324
Claims priority, application France, Sep. 1, 1982, 82 14941
Int. Cl.⁴ H01M *4/60*
U.S. Cl. 429—105 **17 Claims**



1. An electrochemical generator comprising an anode compartment and a cathode compartment, separated by a semipermeable diaphragm and each containing an active elctrode material and an electrolyte, the active electrode material of at least one of the compartments being constituted by an electronically conductive organic polymer, wherein in one of these compartments in which the active electrode material is an organic polymer, the electrolyte of said compartment comprises an electroactive compound, which is soluble in the electrolyte and has a redox potential which is close to that of the organic polymer with which it is in contact, the variation between the redox potentials of the electroactive compound and the organic polymer being up to 500 mv.

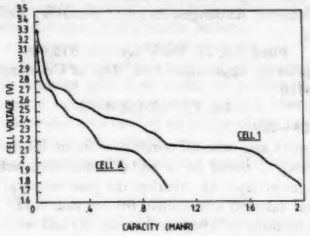
4,547,440

ELECTROCHEMICAL CELL

Alan Hooper, Hinton Waldrist, and John M. North, Newbury, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Apr. 18, 1984, Ser. No. 601,594
Claims priority, application United Kingdom, Apr. 22, 1983, 8310992; Oct. 19, 1983, 8328021
Int. Cl.⁴ H01M *6/36*
U.S. Cl. 429—112 **4 Claims**

1. A solid state electrochemical cell comprising an anode having lithium as its active material, an electrolyte comprising a polymeric material capable of forming a complex with a lithium salt, and a cathode comprising a composite of an insertion electrode material and said polymeric material, where, in one of the electrolyte and the cathode, a lithium salt is present as a complex with said polymeric material to constitute an ionically conducting phase and, in the other of the electrolyte and the cathode, such an ionically conducting phase is absent, and wherein ionic conductivity can be induced in said other of



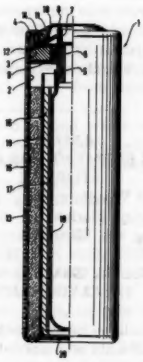
the electrolyte and the cathode at elevated temperature thereby to render the cell operable.

4,547,441

ELECTROCHEMICAL CELL WITH NEGATIVE ACTIVE MATERIAL BASED ON AN ALKALI OR ALKALINE EARTH METAL

Didier Vallin, Ligugé; Jean-Yves Grassien, La Villedieu du Clain; Philippe Chenebault, and Alain Kerouanton, both of Poitiers, all of France, assignors to Saft, Romainville, France,

Filed Dec. 28, 1984, Ser. No. 687,179
Claims priority, application France, Dec. 3, 1984, 84 18399
Int. Cl.⁴ H01M *6/14*
U.S. Cl. 429—196 **11 Claims**



1. Electrochemical cell comprising a negative active material based on an alkali or alkaline earth metal and an electrolyte containing a solute and at least one solvent selected from the group consisting of the liquid oxyhalides, the electrolyte also constituting the positive active material and containing at least one mineral substance selected from the group consisting of the alkali or alkaline earth polyhalogenosulfatometallate having the formula $MM'_m(SO_3X)_n$ in which

M is said alkali or alkaline earth metal,

M' is selected from the group consisting of Al, B, Ga, In, V, Sb, Nb, Si, W and Ta, and

X is selected from the group consisting of chlorine, fluorine, bromine and iodine.

4,547,442

LITHIUM BATTERY ELECTRODE FRAME

Jürgen O. Besenhard, Neusiss; Erich Wudy, and Heinz P. Fritz, both of Garching, all of Fed. Rep. of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Jul. 21, 1983, Ser. No. 515,649

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1982, 3230410

Int. Cl.⁴ H01M *4/00*

U.S. Cl. 429—209 **13 Claims**

1. A support and take-off conductor frame for battery electrodes having a metal or a metal containing active mass, wherein a cover layer M_2 overlies the base material M_1 of the support and take-off conductor frame, said layer M_2 being capable of forming an alloy both with M_1 and with an active material A overlying said layer M_2.

4,547,443

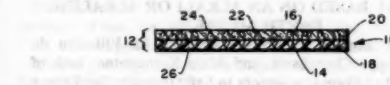
UNITARY PLATE ELECTRODE

John J. Rowlette, Monrovia; Thomas J. Clough, Woodland Hills; Jack Y. Josefowicz, Westlake Village, and John W. Sibert, Venice, all of Calif., assignors to Atlantic-Richfield Company, Los Angeles and California Institute of Technology, Pasadena, both of, Calif.

Filed Nov. 14, 1983, Ser. No. 551,202

Int. Cl.⁴ H01M *4/62*

U.S. Cl. 429—217 **18 Claims**



1. A plate for a lead-acid battery comprising:

a porous body formed of a substrate having a surface layer of conductive tin oxide that is thermodynamically stable during charge and discharge of said battery;

a first layer of matrix resin impregnated into the pores of the body to form a conductive, fluid impervious, first layer;

a second layer adjacent to the first layer containing electrochemically active lead oxide material in the pores of the body.

4,547,444

RECORDING ELEMENT FOR OPTICAL DATA STORAGE

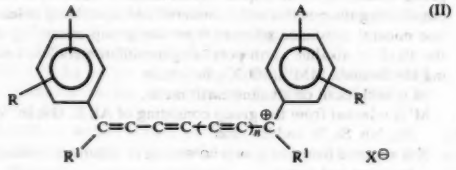
Vivien L. Bell, South Woodford; Ian J. Ferguson, Ickleton, and Mark J. Weatherley, Harlow, all of England, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 23, 1983, Ser. No. 564,937

Int. Cl.⁴ G03C *1/76*

U.S. Cl. 430—11 **24 Claims**

1. An optical recording element in which information can be recorded and read directly afterwards by means of laser light, the element comprising, as a recording medium, an information carrying layer selected from the group consisting of a dye on a substrate and a dye in a polymeric layer, said dye comprising an effective amount of one or more dyes of the formula:



(II)

in which:

n is 0 or an integer,

each A independently represents a hydrogen atom or an electron-donating group providing at least one group A is other than hydrogen,

each R independently represents a hydrogen atom, one or more substituents on the phenyl ring each selected from alkyl, alkenyl, aryl, alkaryl, alkoxy, N,N-dialkylamino, N-alkylamino, amino, amido, halogen atoms, nitro, cyano, ester, carboxyalkoxy, aldehyde, keto, carboxylate, sulfonate or alicyclic groups, any of which groups may be substituted, a fused ring or a bond or the atoms necessary to complete a cyclic structure with the adjacent group R^1 or the polymethine chain,

each R^1 independently represents a hydrogen atom, an alkyl, aryl or alkaryl group any of which groups may be substituted, R^1 optionally completing a cyclic structure with the polymethine chain, or with the adjacent phenyl ring via the substituent R or A,

the free bonds on the polymethine chain being satisfied by substituents independently selected from hydrogen, halogen, hydroxy, alkyl, aryl, the latter two groups being optionally substituted, or the necessary atoms to complete a cyclic structure including at least two carbon atoms in the polymethine chain, and

X^- represents an organic ion, the conjugate acid of which has a pKa value less than 7 or FSO_3 or an inorganic ion of the formula:

$$ML_x^{p-1}$$

in which

M represents B, Al, P, As, Sb or Zn,

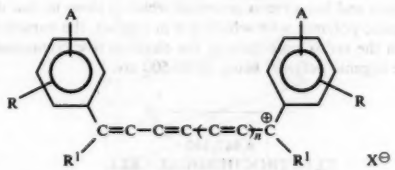
L represents a halogen,

x=4, 5 or 6, and

p is 1 or 2,

the group X^- optionally being covalently bonded to the dye cation such that the molecule is a zwitterion, and either said substrate or said polymeric layer being pregrooved in a circular or spiral pattern.

17. An optical recording element in which laser readable information, selected from the group consisting of digital and analog information, is stored in the form of laser readable detectable marks in a layer comprising an amount of a dye sufficient to absorb laser radiation and produce laser readable detectable marks, said dye comprising one or more dyes of the formula:



(II)

in which:

n is 0 or an integer,

each A independently represents a hydrogen atom or an electron-donating group providing at least one group A is other than hydrogen,

each R independently represents a hydrogen atom, one or more substituents on the phenyl ring each selected from alkyl, alkenyl, aryl, alkaryl, alkoxy, N,N-dialkylamino, N-alkylamino, amino, amido, halogen atoms, nitro, cyano, ester, carboxyalkoxy, aldehyde, keto, carboxylate, sulfonate or alicyclic groups, any of which groups may be substituted, a fused ring or a bond or the atoms necessary to complete a cyclic structure with the adjacent group R^1 or the polymethine chain,

each R^1 independently represents a hydrogen atom, an alkyl, aryl or alkaryl group any of which groups may be substi-

tuted, R^1 optionally completing a cyclic structure with the polymethine chain, or with the adjacent phenyl ring via the substituent R or A,

the free bonds on the polymethine chain being satisfied by substituents independently selected from hydrogen, halogen, hydroxy, alkyl, aryl, the latter two groups being optionally substituted, or the necessary atoms to complete a cyclic structure including at least two carbon atoms in the polymethine chain, and

X^- represents an organic ion, the conjugate acid of which has a pKa value less than 7 or FSO_3^- or an inorganic ion of the formula:

$$ML_x^{p-1}$$

in which M represents B, Al, P, As, Sb or Zn,

L represents a halogen, preferably F or Cl,

x=4, 5 or 6, and

p is 1 or 2,

the group X^- optionally being covalently bonded to the dye cation such that the molecule is a zwitterion, said layer being in the form of a layer on a substrate or a layer of dye in a polymer.

4,547,445
PHOTOGRAPHIC MATERIAL

Miyoshi Asahina; Keishi Kitagawa, and Testuro Fuchizawa, all of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 484,924, Apr. 14, 1983, abandoned. This application Jan. 22, 1985, Ser. No. 693,205

Claims priority, application Japan, Apr. 21, 1982, 57-66911

Int. Cl.[4] G03C *1/78*

U.S. Cl. 430—22 **5 Claims**

1. In a process for placing letters, pictures or stamps fixedly on a back surface of a photographic material, the improvement which comprises said photographic material comprising a water-proof support comprising a paper sheet coated with a polyolefin resin on both surfaces thereof, and a photographic emulsion layer provided onto one of the surfaces of the support, in which another surface of the support is provided with a gelatin layer containing an inorganic pigment and one or more gelatin hardening agents selected from the group consisting of those of the active vinyl type, active halogen type, epoxy type, ethyleneimino type, methanesulfonic acid ester type, carbodiimide type, isoxazole type, active ester type, isocyanate type, dehydration-condensation peptide type and inorganic type, said gelatin layer being present on the surface of the support in an amount of from 0.5 to 20 g/m^2, and containing gelatin and an inorganic pigment in the amount from 85–50 parts by weight and 15–50 parts by weight, respectively, and further containing a gelatin hardening agent in an amount from 0.2 to 3 parts by weight of the gelatin layer, said inorganic pigment having an absorbing capacity of not less than 100 cc/100 g, and placing the letters, pictures or stamps on the surface of said gelatin layer.

4,547,446
MOTION MEASUREMENT AND ALIGNMENT METHOD AND APPARATUS

Wai-Ming Tam, Danbury, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jun. 20, 1983, Ser. No. 505,591

Int. Cl.[4] G03F *9/00*

U.S. Cl. 430—22 **4 Claims**

1. A method of making wafer-tools for use with a master mask for testing wafer coarse stage motion measurement and wafer fine stage motion measurement in an optical lithographic system comprising the steps of:

inserting said master masks, having an alignment pattern, a wafer coarse stage motion measurement pattern and a wafer fine stage motion measurement pattern thereon, into a projection mask aligner,

aligning said master mask to a specific location in said aligner,

inserting a first photoresist-coated semiconductor wafer into said projection mask aligner,

aligning said master mask and said first wafer with respect to each other using said alignment pattern,

exposing the photoresist on said first wafer,

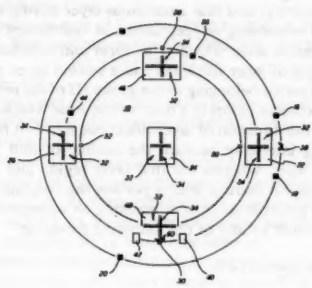
removing said first wafer from said projection mask aligner,

chemically etching said first wafer to perfect the coarse stage motion measurement pattern thereon, thereby forming a first wafer-tool having an image of the coarse stage motion measurement pattern,

again aligning said master mask to a specific location in the aligner,

inserting the first wafer-tool in the aligner,

aligning the first wafer-tool to said master mask,



rotating said master mask through a preselected portion of a revolution,

aligning said master mask to the first wafer-tool using the coarse stage motion measurement pattern,

removing said first wafer-tool from said projection mask aligner,

inserting a second photoresist-coated semiconductor wafer into said projection mask aligner,

exposing the photoresist on said second wafer,

removing said second wafer from said projection mask aligner, and

chemically etching said second wafer to perfect the fine stage motion measurement pattern thereon, thereby forming a second wafer-tool having an image of the fine stage motion measurement pattern.

4,547,447
PHOTOSENSITIVE MEMBERS FOR ELECTROPHOTOGRAPHY CONTAINING PHTHALOCYANINE

Hideaki Ueda, Kishiwada, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 513,043, Jul. 12, 1983, abandoned. This application Jul. 6, 1984, Ser. No. 628,299

Claims priority, application Japan, Jul. 14, 1982, 57-122361; Jul. 16, 1982, 57-124839; May 27, 1983, 58-94604; Jun. 7, 1983, 58-102406

Int. Cl.[4] G03G *5/06*

U.S. Cl. 430—78 **5 Claims**

1. A photosensitive member comprising a photosensitive layer which includes phthalocyanine photoconductive material dispersed in a resin binder, said binder including a thermosetting acrylic resin containing hydroxyl groups or amide bonds, and a melamine resin, the mixing weight ratio of said acrylic resin to malamine resin being about 95:5 to 40:60, and said phthalocyanine photoconductive material being included in the photosensitive layer in an amount of 15 to 100 parts by weight with respect to 100 parts by weight of said binder.

4,547,448

PHOTOCONDUCTIVE MEMBER COMPRISING SILICON AND OXYGEN

Shigeru Shirai, Yamato; Kyosuke Ogawa, Sakurashin; Junichiro Kanbe, Yokohama; Keishi Saitoh, Tokyo; Yoichi Osato, Yokohama, and Teruo Misumi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 470,599, Feb. 28, 1983, abandoned. This application Jul. 6, 1984, Ser. No. 627,499

Claims priority, application Japan, Mar. 4, 1982, 57-34210; Mar. 5, 1982, 57-35633; Mar. 5, 1982, 57-35634

Int. Cl.[4] G03G *5/082*

U.S. Cl. 430—84 **22 Claims**

1. A photoconductive member comprising:

a support for a photoconductive member;

a first amorphous layer comprising an amorphous material containing silicon atoms as a matrix and exhibiting photoconductivity, said first amorphous layer having a first layer region containing oxygen atoms as constituent atoms in a distribution state which is uniform and continuous in the direction of layer thickness and a second layer region containing atoms belonging to the group III of the periodic table as constituent atoms in a distribution state which is continuous in the direction of layer thickness, said first layer region existing internally beneath the surface of said first amorphous layer, wherein the first layer region and the second layer region share at least a portion thereof; and

a second amorphous layer comprising an amorphous material represented by any of the following formulae:

$$Si_aC_{1-a}(0.4<a<1) \quad (1)$$

$$(Si_bC_{1-b})_cH_{1-c}(0.5<b<1,\ 0.6\leqq c<1) \quad (2)$$

$$(Si_dC_{1-d})_eX_{1-e}(0.47<d<1,\ 0.8\leqq e<1) \quad (3)$$

$$(Si_fC_{1-f})_g(H+X)_{1-g}(0.47<f<1,\ 0.8\leqq g<1) \quad (4)$$

wherein X represents a halogen atom.

4,547,449

LIQUID ELECTROGRAPHIC DEVELOPERS CONTAINING QUATERNARY AMMONIUM CHARGE-CONTROL POLYMERS HAVING ACIDIC MONOMERS

Peter S. Alexandrovich; Louis J. Sorriero, both of Rochester, and Chandra Sreekumar, Penfield, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 465,747, Feb. 11, 1983, abandoned. This application Jan. 16, 1985, Ser. No. 691,799

Int. Cl.[4] G03G *9/12*

U.S. Cl. 430—115 **10 Claims**

1. A liquid electrographic developer comprosition comprising an electrically insulating liquid carrier containing (a) dispersed toner particles, (b) a charge-control agent comprising an addition copolymer of a quaternary ammonium salt monomer, a solubilizing monomer and an acidic insolubilizing monomer having an acidic function selected from the group consisting of —COOH, —SO_3H and —PO_3HR wherein R is hydrogen or alkyl, and the amount of solubilizing monomer is sufficient to render said charge-control agent soluble in said liquid carrier, and (c) a charging addition copolymer comprising a polar monomer and a solubilizing monomer which may be the same as or different from the solubilizing monomer in said charge-control agent, and is present in an amount sufficient to render said charging addition copolymer soluble in said carrier liquid.

4,547,450

SILVER HALIDE SENSOR TYPE POLYMERIZABLE LIGHT-SENSITIVE MATERIAL

Minoru Maeda, Shizuoka; Masayuki Iwasaki, Kanagawa; Noriyuki Inoue, and Mikio Totsuka, both of Shizuoka, all of Japan, assignors to Fuji Photo Film Company, Kanagawa, Japan

Filed Jan. 13, 1983, Ser. No. 457,602

Claims priority, application Japan, Jan. 13, 1982, 57-3655

Int. Cl.[4] G03C *5/54*

U.S. Cl. 430—202 **19 Claims**

1. A process for forming polymeric images comprising:

providing a light-sensitive material comprising a support having thereon (a) a silver halide photographic emulsion layer, (b) a polymerizable layer adjacent said emulsion layer, said polymerizable layer containing a nongaseous ethylenically unsaturated compound capable of undergoing addition polymerization and a binder for the polymerizable layer, and (c) a reducing compound in said emulsion layer or said polymerizable layer, said reducing compound being a compound capable of reducing said silver halide and capable of initiating polymerization in said polymerizable layer upon reduction of the silver halide; and

image-wise exposing the light-sensitive material to form latent image areas in the silver halide emulsion layer forming polymeric images in the polymerizable layer, in the areas of the polymerizable layer which correspond to the areas of the silver halide having the latent image areas by processing said light-sensitive material with a processing solution having a pH of 8 or more after image-wise exposure.

2. A process as claimed in claim 1, wherein the polymerizable layer contains the reducing compound.

11. A process forming polymeric images comprising:

providing a light-sensitive material comprising a support having thereon a silver halide photographic emulsion layer and a polymerizable layer adjacent said emulsion layer, wherein said polymerizable layer comprises a nongaseous ethylenically unsaturated compound capable of undergoing addition polymerization and a binder for the polymerizable layer;

image-wise exposing the light-sensitive material to form latent image areas in the silver halide emulsion layer; and

forming polymeric images in the polymerizable layer, in the areas of the polymerizable layer which correspond to the areas of the silver halide having the latent image areas by processing said light-sensitive material with a processing solution containing a reducing compound and having a pH of 8 or more after image exposure, wherein said reducing compound is a compound capable of reducing said silver halide and capable of initiating polymerization in said polymerizable layer upon reduction of the silver halide.

16. A process as claimed in claim 11, wherein the processing solution contains sulfurous acid ion in an amount effective to accelerate the polymerization of the nongaseous ethylenically unsaturated compound.

4,547,451

HYDROLYZABLE DIFFUSION CONTROL LAYERS IN PHOTOGRAPHIC PRODUCTS

Stanley J. Jasne, Andover; William C. Schwarzel, Billerica; Charles I. Sullivan, Melrose, and Lloyd D. Taylor, Lexington, all of Mass., assignors to Polaroid Corporation, Patent Dept., Cambridge, Mass.

Continuation-in-part of Ser. No. 493,013, May 9, 1983, abandoned. This application Feb. 21, 1985, Ser. No. 703,871

Int. Cl.[4] G03C *1/40, 5/54, 7/20*

U.S. Cl. 430—215 **25 Claims**

1. A photographic diffusion transfer film unit comprising:

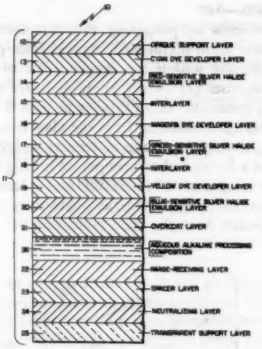
a support layer;

a photosensitive silver halide emulsion layer having associ-

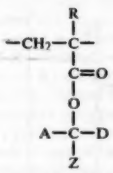
ated therewith a diffusion transfer process image-providing material;

an alkaline processing composition permeable image-receiving layer; and, in addition to said layers;

at least one diffusion control layer including a hydrolyzable polymer, the layer being adapted to conversion from a condition of impermeability to alkali or materials soluble in or solubilized by an alkaline processing composition to



a condition of substantial permeability thereto, by a predetermined hydrolysis of the polymer under the alkaline conditions of an alkaline photographic processing composition, and being free of permeation-promoting materials which adversely affect the capacity of the layer to maintain said condition of impermeability until the occurrence of said predetermined hydrolysis, the hydrolyzable polymer comprising repeating units having the formula



wherein R is hydrogen, halogen or lower alkyl; A and D are each independently hydrogen, alkyl, alkoxy, aryl, alkaryl or aralkyl; and Z represents an electron-withdrawing group which, upon contact of the polymer with alkali, activates the hydrolytic degradation of the polymer with accompanying formation of an acrylate anion, or represents an electron-withdrawing group which, upon contact of the polymer with alkali, is itself hydrolyzed with accompanying formation of a residual carboxylate anion.

4,547,452

COLOR DIFFUSION TRANSFER PHOTOGRAPHIC ELEMENT WITH SUFINIC ACID

Ichizo Toya, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Sep. 29, 1983, Ser. No. 537,208

Claims priority, application Japan, Sep. 29, 1982, 57-170077

Int. Cl.[4] G03C *5/54, 1/40, 5/30*

U.S. Cl. 430—216 **21 Claims**

1. A color diffusion transfer photographic element comprising at least one light-sensitive element containing a silver halide emulsion layer and an alkaline processing composition element, said alkaline processing composition element containing a compound which is an aliphatic sulfinic acid, an aromatic sulfinic acid or a salt thereof.

4. A color diffusion transfer photographic element as claimed in claim 1, wherein said light-sensitive element further comprises a mordant layer (dye image-receiving layer) and said silver halide emulsion layer is associated with a dye image-providing material, and wherein said alkaline processing composition element comprises a container containing an alkaline processing composition, and wherein said photographic element further comprises a cover sheet.

4,547,453

COMPRESSIBLE PHOTOPOLYMER PRINTING PLATE

John R. Worns; James W. Chase, both of Mishawaka, and Bruce W. Capriotti, South Bend, all of Ind., assignors to Uniroyal, Inc., Middlebury, Conn.

Continuation-in-part of Ser. No. 230,926, Feb. 2, 1981, abandoned. This application Nov. 21, 1983, Ser. No. 554,039

Int. Cl.[4] G03C *1/24*

U.S. Cl. 430—271 **9 Claims**

1. A layered sheet construction suitable after processing for use as a relief printing plate having a thickness of at least 0.08 inch comprising

(A) a photosensitive image layer having a 300% modulus of elasticity of 100–1000 psi comprising 100 parts elastomeric polymer, 5 to 30 parts ethylenically unsaturated compound and 0.1 to 5 parts photoinitiator activatable by actinic radiation, all by weight; bonded to

(B) a foamed poly(vinylchloride) layer having a thickness of 0.020–0.150 inch, a recovery rate of at least 80%, a compression value of 0.003–0.030 inch and a density of 10–40 lbs/ft^3; bonded to

(C) a dimensionally stable supporting layer.

4,547,454

PHOTOSENSITIVE MULTI-LAYER MATERIAL AND PREPARATION OF ADHESIVE LAYERS EMPLOYED THEREIN

Gerhard Hoffmann, Otterstadt; Bernd Bronstert, Frankenthal; Herbert Hahn, Ludwigshafen, and Mong-Jon Jun, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 324,279, Nov. 23, 1981, abandoned. This application Nov. 14, 1984, Ser. No. 650,713

Claims priority, application Fed. Rep. of Germany, Dec. 3, 1980, 3045515

Int. Cl.[4] G03C *1/78*

U.S. Cl. 430—271 **2 Claims**

1. A photosensitive multi-layer material which has, between

(a) a base B and

(b) a photosensitive layer R consisting of a mixture containing at least one polymeric binder, at least one photopolymerizable ethylenically unsaturated low molecular weight compound compatible therewith and at least one photoinitiator,

(c) an adhesive layer AL, adjacent to the photosensitive layer R, which has been cured by heating to a temperature of from 60° to 120° C. and is based on an intimate mixture consisting essentially of

(A1) 65–98% by weight of a polymeric binder which is compatible with the polymeric binder of the layer R and with the condensate (A2), and

(A2) 2–35% by weight of a melamine-formaldehyde condensate, hardenable at 60°–120° C., which contains 1–5 melamine units per molecule and has a degree of methlolation of the melamine of 40–100%, 10–60% of the methylol groups being etherified with an alcohol.

4,547,455
PROCESS OF FORMING POLYIMIDE PATTERN AND DEVELOPER THEREFOR

Hiroo Hiramoto, Ohtsu, and Masuichi Eguchi, Kyoto, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jun. 17, 1983, Ser. No. 505,206
Claims priority, application Japan, Jun. 22, 1982, 57-107180
Int. Cl.[4] G03C 5/16, 1/70
U.S. Cl. 430—325 28 Claims

1. A process of forming a polyimide pattern on a base plate, which comprises:

(1) providing to the base plate a layer of photosensitive polyimide precursor comprising a polyimide precursor and a compound having a photosensitive group and an amino group,

(2) exposing the layer imagewise to actinic radiation through a photomask to form an exposed image pattern of polyimide precursor in the layer,

(3) removing unexposed areas of the layer with a developer containing;

(A) at least one solvent selected from the group consisting of N, N-dimethylacetamide, N-methyl-2-pyrrolidone, N, N-dimethylformamide, dimethylsulfoxide and γ-butyrolactone,

(B) methanol, and

(C) at least one solvent represented by the formula:

$$R^1OCH_2CH_2OCH_2CH_2OR^2$$

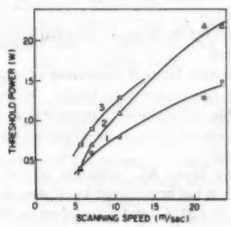
wherein R^1 is a hydrogen atom or the same as R^2 and R^2 is an alkyl group having 1 to 4 carbon atoms, and

(4) curing the exposed image pattern of the polyimide precursor in the layer by heating.

4,547,456
HEAT MODE RECORDING MATERIAL AND A RECORDING METHOD BY THE USE THEREOF

Yasuo Kojima, Hachioji, and Fumio Shimada, Fusa, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Continuation of Ser. No. 255,180, Apr. 17, 1981, abandoned.
This application Sep. 29, 1983, Ser. No. 537,063
Claims priority, application Japan, Apr. 22, 1980, 55-53739; Sep. 29, 1980, 55-134463
Int. Cl.[4] G03C 1/71
U.S. Cl. 430—330 20 Claims



1. A heat mode recording material which comprises a support and a heat sensitive layer positioned on said support, said heat sensitive layer comprising;

(a) an ionomer resin obtained by ionically cross-linking with at least one metal ion, a copolymer comprising an alpha-olefin and an alpha-methylene aliphatic monocarboxylic acid; and

(b) a hydrophilic binder.

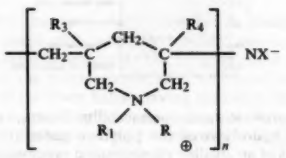
4,547,457
PROCESS OF PREPARING TONER TREATED WITH POLYMERIC QUATERNARY AMMONIUM SALT AND SLIP AGENT

Eugene L. Grubb, Colts Neck, and Howard Matrick, Highlands, both of N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 30, 1984, Ser. No. 595,362
Int. Cl.[4] G03C 5/04
U.S. Cl. 430—449 7 Claims

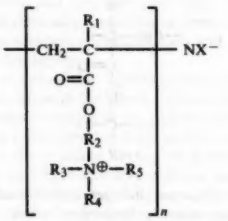
1. A process of preparing dry nonelectroscopic surface coated toner from pigmented organic resin particles having a size distribution within the range of 0.2 to 30 micrometers, which comprises (1) mixing in either order or simultaneously with the pigmented resin particles at least 0.1% by weight of liquid a slip agent selected from the class consisting of silicone oil having a weight average molecular weight of about 230 to 50,000 and a fluorocarbon compound having a weight average molecular weight of 500 to 500,000 and at least 0.5% by weight of a water soluble, polymeric quaternary ammonium compound selected from the class consisting of

(a)



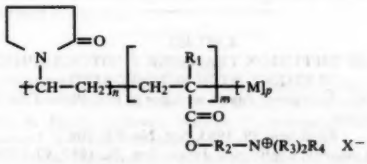
wherein R_1 and R_2 are independently selected from alkyl groups of 1 to 4 carbon atoms, R_3 and R_4 are independently selected from H or CH_3, n is a number from 100 to 50,000, and X is a water-solubilizing anion;

(b)



where R_1 is H or CH_3; R_2 is C_xH_{2x} where x=2–18; R_3 and R_4 are C_xH_{2x+1} where x=1–4; R_5 is the same as R_3 or ϕ—CH_2; X is a water-solubilizing anion; and n is 50 to 20,000;

(c)

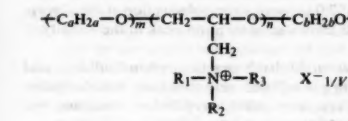


where n is 40 to 90 mole percent, m is 5 to 40 mole percent, p is 0 to 50 mole percent, and n+m+p=100; R_1 is H or CH_3; R_2 is C_xH_{2x} where x=1 to 18; R_3 is CH_3 or CH_2CH_3; R_4 is CH_3, CH_2CH_3 or ϕ—CH_2; X is a water-solubilizing anion and M is a vinyl monomer unit resulting from the heteropolymerization employing an optional monovinyl nonhydroxy-containing monomer different from and copolymerizable with the m or n units and a

weight average molecular weight of 10,000 to 1,000,000,

(d)

where R_{cell} is a residue of an anhydroglucose unit from cellulose ($C_6H_{10}O_5$), methyl cellulose, ethyl cellulose, hydroxyethylcellulose, or hydroxypropyl methyl cellulose; y is the degree of polymerization of 50–20,000 or more; and R may be the same or different and is:



where a is an integer from 2 to 3; b is an integer from 2 to 3; c is an integer from 1 to 3; n is an integer from 1 to 3; m is an integer from 0 to 10; p is an integer from 0 to 10; and q is an integer from 0 to 1; a may be equal to or different from b; c may be equal to or different from n and m may be equal to or different from p; R′ is a member of a group consisting of H, COOH, COONa, COOK, $COONH_4$ with the proviso that when q is zero, R′ is H; R_1, R_2 and R_3 taken individually represent a member selected from a group consisting of alkyl, aryl, aralkyl, alkaryl, cycloalkyl, alkoxyalkyl, and alkoxyaryl radicals where each of R_1, R_2 and R_3 can contain up to 10 carbon atoms with the proviso that when said member is an alkoxyalkyl radical there are at least two carbon atoms separating the oxygen atom from the nitrogen atom, and with the further proviso that the total number of C atoms in radicals represented by R_1, R_2 and R_3 is from 3 to 12 with the further proviso that when R_1, R_2 and R_3 are taken together the nitrogen atom to which R_1, R_2 and R_3 are attached can be a component of a heterocyclic ring selected from a group consisting of pyridine, alpha-methyl pyridine, 2,5-dimethyl pyridine; 2,4,6-trimethyl pyridine, N-methylpiperidine, N-ethylpiperidine, N-methyl morpholine and N-ethyl morpholine; X is a water-solubilizing anion, and V is an integer equal to the valence of X; the average value of n per anhydroglucose unit of said cellulose ether is from about 0.01 to about 1, and the average value of m+p+q per anhydroglucose unit of said cellulose ether is from about 0.01 to about 4; and

(e) copolymer of hydroxyethyl cellulose and diallyldimethyl ammonium chloride, and (2) then drying the coated toners.

4,547,458

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Toshifumi Iijima, and Kiyoshi Yamashita, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 511,797, Jul. 7, 1983, abandoned. This application Feb. 7, 1985, Ser. No. 699,057
Claims priority, application Japan, Jul. 10, 1982, 57-120240
Int. Cl.⁴ G03C *1/46*
U.S. Cl. 430—505 **26 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having at least one silver halide emulsion layer thereon which has a sensitivity to a certain spectral region, at least one of said silver halide emulsion layers comprising a plurality of different speed light-sensitive layers, wherein the difference in the speed between the fastest-speed layer and the second fastest-speed layer of said plurality of light-sensitive layers is from 0.2 to 0.7 in terms of log I t, and at least said first fastest-speed and second fastest-speed layers each contains at least one monodispersed silver halide emulsion which is light-sensitive and consists substantially of a monodispersed silver halide having a granularity distribution

$$S/\bar{r} \leqq 0.15, \; S = \sqrt{\Sigma\,(\bar{r} - ri)^2 ni / \Sigma\, ni} \quad \text{and} \quad \bar{r} = \frac{\Sigma\, rini}{\Sigma\, ni}$$

wherein S is the standard deviation of particle size, r is the average particle size, and ri and ni are the particle size of the ith particle and the number of particles having size ri respectively.

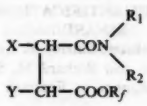
4,547,459

PHOTOGRAPHIC SILVER HALIDE MATERIALS CONTAINING A HIGH SPEED COATING AID

Takayoshi Kamio; Kunihiko Ohga, and Yasuo Mukunoki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 7, 1981, Ser. No. 309,362
Claims priority, application Japan, Oct. 8, 1980, 55-140967
Int. Cl.⁴ G03C *1/72*
U.S. Cl. 430—631 **7 Claims**

1. A photographic silver halide light-sensitive material comprising a support and at least one silver halide emulsion layer on the support, wherein the emulsion layer or another hydrophilic organic colloid layer contains a compound represented by formula (I)



(I)

wherein R_1 and R_2 represent the same or different groups and are each hydrogen, an alkyl group, or an aryl group, or R_1 and R_2 can be linked together to form an N-containing heterocyclic ring, provided that R_1 and R_2 are not both hydrogens; R_f is a fluorine-containing alkyl group; one of X and Y is a hydrogen atom and another is a $-SO_3M$ group wherein M is a cation.

4,547,460

MULTIZONE ANALYTICAL ELEMENT AND METHOD FOR ANALYTE DETERMINATION

Jon N. Eikenberry, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

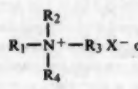
Filed Apr. 16, 1984, Ser. No. 600,641
The portion of the term of this patent subsequent to Oct. 15, 2002, has been disclaimed.
Int. Cl.⁴ C12Q *1/32, 1/48;* G01N *33/52*
U.S. Cl. 435—15 **21 Claims**

16. A method for the determination of an analyte in an aqueous liquid, which determination is substantially unaffected by the presence of bilirubin, said method comprising the steps of:

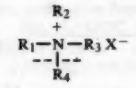
A. physically contacting a sample of said liquid containing the analyte together with an interactive composition for said analyte and a multizone analytical element to provide a detectable change in said element, said element comprising, in fluid contact,

a registration zone, and

a porous spreading zone to receive and transport an applied sample of said aqueous liquid, said spreading zone containing a nonpolymeric quaternary ammonium compound represented by the structures:



Ia.



Ib.

wherein ------ represents a single or double bond;

R_1, R_2, R_3 and R_4 are independently alkyl of 1 to 30 carbon atoms; aryl of 6 to 14 carbon atoms; cycloalkyl of 5 to 20 carbon atoms; or alkaryl of 7 to 30 carbon atoms; provided that R_1, R_2, R_3 and R_4 together comprise at least 12 carbon atoms; or R_1 and R_2 taken together with the nitrogen atom, form a quaternary 5- to 16-membered heterocyclic ring and R_3 and R_4 are as defined above and comprise together at least 12 carbon atoms; or R_1, R_2 and R_3 taken together with the nitrogen atom, form a quaternary 5- to 16-membered heterocyclic ring and R_4 is as defined aove and comprises at least 12 carbon atoms; and X^- is a monovalent anion;

said quaternary ammonium compound being present in said spreading zone in an amount effective to substantially eliminate interference caused by of bilirubin on said analyte determination; and

B. measuring said detectable change.

4,547,461

COMPOSITION, ANALYTICAL ELEMENT AND METHOD FOR THE QUANTIFICATION OF CREATINE KINASE

Theodore W. Esders, Webster; Shirley Y. Lynn, John B. Findlay, both of Rochester, and Richard M. Schubert, Spencerport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 18, 1983, Ser. No. 459,026

Int. Cl.[4] C12Q *1/29, 1/50, 1/48, 1/26, 1/28;* **C12N** *9/12;* **G01N** *1/48, 21/06*

U.S. Cl. 435—17 **26 Claims**

1. A composition for the quantification of creatine kinase in an aqueous liquid, said composition comprising:

(a) creatine phosphate;

(b) adenosine diphosphate;

(c) glycerol;

(d) glycerol kinase;

(e) α-glycerophosphate oxidase;

(f) a colorimetric indicator composition comprising a chromogen; and

(g) a mercapto-containing creatine kinase activator which is present in encapsulated form or at a concentration such that it will not interfere with said colorimetric indicator composition.

4,547,462

PROCESS FOR PREPARING SUBSTANCE HAVING CARCINOSTATIC AND IMMUNOSTIMULATING ACTIVITY

Kenzo Tamai, Kanazawa; Isamu Saikawa, Toyama; Takashi Yasuda, Toyama; Shohachi Murakami, Toyama; Toyoo Maeda, Kanazawa; Hisatsugu Tsuda, Toyama; Hiroshi Sakai, Takaoka; Masatoshi Sugita, Toyama; Yoshiko Yamamoto, Namerikawa; Hisashi Minami, and Takako Hori, both of Toyama, all of Japan, assignors to Toyama Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1983, Ser. No. 523,438

Claims priority, application Japan, Aug. 17, 1982, 57-142439

Int. Cl.[4] C12P *19/00;* **C12R** *1/01*

U.S. Cl. 435—72 **11 Claims**

1. A process for preparing a carcinostatic substance TF-500 having the following properties or a salt thereof, which comprises subjecting *Fusobacterium nucleatum* ATCC 31647 or mutants thereof to extraction treatment with a dialkyl sulfoxide and collecting the said substance from the extract:

(a) Grayish white-light brown powder,

(b) It has a carcinostatic and immunostimulating activity,

(c) It is soluble in water but insoluble in methanol, ethanol, acetone, benzene, chloroform, ethyl acetate and diethyl ether,

(d) It has no clear melting point, and begins to decompose at about 180° C. and remarkably decomposes above 195° C.,

(e) The infrared absorption spectrum obtained by the KBr method has absorption bands in the vicinities of 3500–3200, 2920, 2850, 1660–1600, 1580–1520, 1460–1400, 1380–1360, 1120–1100, 1080–1000, 970 and 840–800 cm^{-1},

(f) The ultraviolet absorption spectrum of its aqueous solution at a pH of 7.0 shows a strong absorption at the absorption edge, and shows an absorption peak in the vicinity of 246–280 nm,

(g) It is positive in Molisch reaction, phenolsulfuric acid reaction, anthrone-sulfuric acid reaction, indole-hydrochloric acid reaction and Lowry-Folin's reaction, but negative in ninhydrin reaction,

(h) Elementary analysis values C: 38–47%, H: 5–7%, N: 1–4%,

(i) The saccharide content as determined by a phenol-sulfuric acid method is about 12–30% by weight in terms of glucose, and its protein content as determined by Lowry-Folin's method is about 10% by weight or less in terms of bovine serum albumin.

4,547,463

METHOD OF IMMOBILIZING MICROORGANISMS

Co Sakata, Kawasaki, and Hirosuke Imai, Yokohama, both of Japan, assignors to Nippon Oil Company, Ltd., Japan

Filed May 18, 1982, Ser. No. 379,319

Claims priority, application Japan, May 18, 1981, 56-73438

Int. Cl.[4] C12N *11/08*

U.S. Cl. 435—180 **10 Claims**

1. Method of immobilizing microorganisms which comprises the steps of bringing a suspension of living cells of a microorganism into contact with water-insoluble copolymer gel particles containing 10 to 99% by weight of structural units derived from 2-Acrylamidoethanesulfonic acid or a derivative thereof and a remainder of either a crosslinkable vinyl monomer having two or more ethylenic double bonds or of such a crosslinkable vinyl monomer having two or more ethylenic double bonds and a monoethylenic monomer, to cause the microorganism to become adsorbed on the copolymer gel particles, and bringing the water-insoluble copolymer gel particles having the microorganism adsorbed thereon into contact with a nutrient medium for the cultivation of the microorganism to increase the number of cells present on the copolymer gel particles.

4,547,464

FETAL PULMONARY MATURITY TEST

Michael Socol, 4250 N. Marine Dr., Apt. 922, Chicago, Ill. 60613

Filed Mar. 12, 1984, Ser. No. 588,537

Int. Cl.[4] G01N *33/48, 13/00*

U.S. Cl. 436—2 **8 Claims**

1. A method for testing for fetal pulmonary immaturity comprising the steps of withdrawing amniotic fluid from a pregnant mother, acidifying a predetermined amount of said amniotic fluid, adding an approximately equal volume of an alkyl ether to form a testing solution having an ether layer over an amniotic fluid layer; agitating said testing solution sufficiently to create a multitude from about 200 to 300 of bubbles in said ether layer, permitting said agitated testing solution to rest for an observational period of at least 2 minutes, observing the number of bubbles remaining in said ether layer after the

passage of said observational period, and from said number of remaining bubbles predicting the maturity or immaturity of the fetal pulmonary function of the fetus within the womb of the pregnant mother.

4,547,465

ANALYTICAL ELEMENT HAVING IMPROVED SPREADING ZONE AND METHOD OF USE

Jon N. Eikenberry, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 16, 1984, Ser. No. 600,646

The portion of the term of this patent subsequent to Oct. 15, 2002, has been disclaimed.

Int. Cl.⁴ C12Q *1/32, 1/48;* G01N *33/52*

U.S. Cl. 436—170 **20 Claims**

16. A method for the determination of an analyte in an aqueous liquid, said method comprising the steps of:

A. physically contacting a sample of said liquid together with an interactive composition for said analyte and a dry analytical element to provide a detectable change,

said element comprising an isotropically porous zone which comprises a blush polymer having dispersed therein a particulate material, and a nonopolymeric heterocyclic, aliphatic or carbocyclic quaternary ammonium compound having at least 12 carbon atoms therein, which compound is present in said zone in an amount of at least about 2 weight percent, based on the dry weight of said blush polymer; and

B. measuring said detectable change.

4,547,466

DETECTING RHEUMATOID FACTOR WITH SYNTHETIC PARTICLES HAVING IMMUNE COMPLEXES THEREON

Michael F. Turanchik, Malvern, Pa.; Kwok K. Yeung, and Nathan L. Smith, North Andover, Mass., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 1, 1983, Ser. No. 499,957

Int. Cl.⁴ G01N *33/54*

U.S. Cl. 436—509 **38 Claims**

1. A process for preparing a diagnostic reagent for Rheumatoid Factor which comprises the steps:

(a) attaching to suspendable synthetic particles an antigen to form particles having multiple active antigen sites,

(b) incubating a suspension of said particles having multiple active antigen sites with a solution containing a gamma-globulin to the antigen under conditions forming a substantially non-agglomerated suspension of particles having multiple antigen/gamma-globulin immune complexes thereon which are active as antigens to Rheumatoid Factor as antibody,

(c) recovering said particles having multiple antigen/gamma-globulin immune complexes thereon from suspension, and

(d) resuspending said particles having multiple antigen/gamma-globulin immune complexes thereon in a storage-stable medium.

4,547,467

DIELECTRIC COMPOSITION AND DEVICES USING IT

Edward G. Barth, Union; Ruvim Braude, Elizabeth, and Nicholas W. Kay, Mine Hill, all of N.J., assignors to Burroughs Corporation, Detroit, Mich.

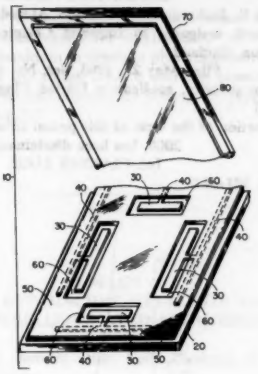
Filed Jun. 22, 1983, Ser. No. 506,813

Int. Cl.⁴ C03C *3/12;* H01J *17/00*

U.S. Cl. 501—20 **8 Claims**

1. A dielectric ink composition for forming thick film dielectric layers comprising

a lead-free glass frit binder, silica, a pigment, and a vehicle, said glass frit having a composition including about 20% by weight of SiO_2, about 20% by weight of B_2O_3, about 3% by weight of CaO, about 40% by weight of ZnO, about 5% by weight of Al_2O_3, about 7% by weight of Na_2O, about 4% by weight of K_2O, and about 1% by weight of Li_2O,



said ink composition being fireable at temperatures below 600° C.

4,547,468

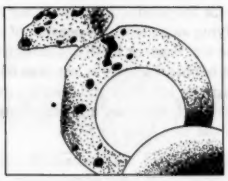
HOLLOW PROPPANTS AND A PROCESS FOR THEIR MANUFACTURE

Arfon H. Jones, and Raymond A. Cutler, both of Salt Lake City, Utah, assignors to Terra Tek, Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 291,257, Aug. 10, 1981, abandoned. This application Jun. 30, 1983, Ser. No. 509,991

Int. Cl.⁴ C03C *3/22*

U.S. Cl. 501—33 **17 Claims**



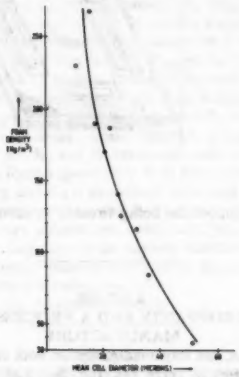
1. A hollow ceramic proppant comprising, a polycrystalline ceramic sphere having a dense case with an average grain size of less than thirty (30) μm in diameter, a central void that is greater than five (5) and less than fifty (50) volume percent of the proppant, the proppant having a specific gravity lower than three point three (3.3) gm/cc and a crushing strength equal to or greater than that of Ottowa sand at closure stresses above 34.5 MPa, or five thousand (5,000) psi.

12. A process for producing hollow ceramic proppants, including the steps of mixing a fine polycrystalline ceramic powder of particles of sizes less than twenty-five (25) μm in diameter with water and organic binders; injecting the mixture through a nozzle into a spray dryer, wherein, a temperature of between one hundred degress (100°) and four hundred degrees (400°) Centigrade (C) is maintained; passing the injected particles against a hot air flow; and sintering the particles at a sufficient temperature to produce proppant having a dense case with an average grain size of less than thirty (30) μm in diameter, a central void that is greater than five (5) volume percent of the proppant, the proppant having a specific gravity lower than three point three (3.3) gm/cc and a crushing strength equal to or greater than that of Ottowa sand at closure stresses of above 34.5 MPa, or five thousand (5,000) psi.

4,547,469
INORGANIC FOAMS

Graham V. Jackson, and William N. Meredith, both of Chester, England, assignors to Imperial Chemical Industries PLC, London, England

Filed May 25, 1983, Ser. No. 498,171
Claims priority, application United Kingdom, Jun. 3, 1982, 8216210
The portion of the term of this patent subsequent to Jul. 26, 2000, has been disclaimed.
Int. Cl.[4] C04B 21/02
U.S. Cl. 501—84 20 Claims



1. A rigid foam of cellular structure comprising one or more layer minerals wherein the mean cell diameter is less than 60 microns, the cells are of diameter below 150 microns and at least 90% of the cells have a diameter less than 100 microns.

9. A process for the production of a strong rigid foam which comprises gasifying an aqueous suspension of a layer mineral to produce a stable wet foam or froth containing bubbles of gas of which the mean bubble diameter is less than 60 microns, at least 90% have a diameter less than 100 microns and the maximum diameter is below 150 microns, and removing at least part of the water from the wet foam or froth.

4,547,470
SIALON-BASE CERAMIC MATERIALS EXCELLENT IN WEAR RESISTANCE

Teruyoshi Tanase, Tokyo; Kenichi Nishigaki, and Tatsuro Ajima, both of Ohmiya, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 17, 1984, Ser. No. 601,379
Claims priority, application Japan, Apr. 25, 1983, 58-72581
Int. Cl.[4] C04B 35/56, 35/58
U.S. Cl. 501—87 10 Claims

1. A Sialon-base ceramic material consisting essentially of:

(a) 1–40 percent by volume at least one dispersed phase-forming component selected from the group consisting of carbide of Ti, Zr, or Hf, nitride thereof, carbo-nitride thereof, and carbo-oxi-nitride thereof;

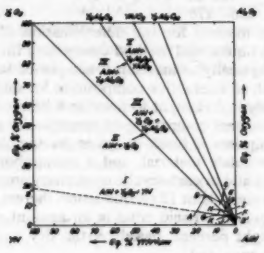
(b) 1–20 percent by volume at least one combined phase-forming component selected from the group consisting of oxide of Li, Na, Ca, Mg, Y, any rare earth element, Ti, Zr, Hf, Si, or Al, and nitride thereof; and

(c) the balance of β-Sialon expressed by a chemical formula $Si_{6-z}Al_zO_zN_{8-z}$, z being larger than 0 but not more than 4.3, and α-Sialon expressed by a chemical formula $M_x(Si, Al)_{12}(O, N)_{16}$, x being larger than 0 but not more than 2, M representing at least one selected from the group consisting of Li, Na, Ca, Mg, Y, and any rare earth element, and inevitable impurities, wherein the ratio of the α-Sialon/the β-Sialon is within a range from 25/75 to 95/5 in volume.

4,547,471
HIGH THERMAL CONDUCTIVITY ALUMINUM NITRIDE CERAMIC BODY

Irvin C. Huseby, Schenectady, and Carl F. Bobik, Burnt Hills, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 18, 1983, Ser. No. 553,213
Int. Cl.[4] C04B 35/58
U.S. Cl. 501—98 53 Claims



1. A process for producing a polycrystalline body comprised of a composition defined and encompassed by line ABCDEFA but not including lines CD and EF of FIG. 1, a porosity of less than about 5% by volume of said body and a thermal conductivity greater than 1.0 W/cm·K at 22° C. which comprises forming a mixture comprised of aluminum nitride powder and an yttrium additive selected from the group consisting of yttrium, yttrium hydride, yttrium nitride and mixtures thereof, said aluminum nitride and yttrium additive containing oxygen, shaping said mixture into a compact, said mixture and said compact being comprised of a composition wherein the equivalent % of yttrium, aluminum, nitrogen and oxygen is defined and encompassed by line ABCDEFA but not including lines CD and EF in FIG. 1, said mixture, said compact and said polycrystalline body being comprised of from greater than about 1.6 equivalent % yttrium to about 19.75 equivalent % yttrium, from about 80.25 equivalent % aluminum up to about 98.4 equivalent % aluminum, from greater than about 4.0 equivalent % oxygen to about 15.25 equivalent % oxygen and from about 84.75 equivalent % nitrogen up to about 96 equivalent % nitrogen, and sintering said compact at a temperature ranging from about 1850° C. to about 2170° C. in an atmosphere at ambient pressure selected from the group consisting of nitrogen, argon, hydrogen and mixtures thereof to produce said polycrystalline body, said compact containing sufficient equivalent percent of yttrium and oxygen to form a sufficient amount of liquid phase at sintering temperature to densify the compact to produce said polycrystalline body, said sintering temperature being a sintering temperature for said compact.

10. A polycrystalline aluminum nitride body comprised of a composition defined and encompassed by line ABCDEFA but not including lines CD and EF of FIG. 1, said polycrystalline body being comprised of from greater than about 1.6 equivalent % yttrium to about 19.75 equivalent % yttrium, from about 80.25 equivalent % aluminum up to about 98.4 equivalent % aluminum, from greater than about 4.0 equivalent % oxygen to about 15.25 equivalent % oxygen and from about 84.75 equivalent % nitrogen up to about 96 equivalent % nitrogen, said polycrystalline body having a porosity of less than about 5% by volume of said body and a thermal conductivity greater than 1.0 W/cm·K at 22° C.

52. A polycrystalline body having a phase composition comprised of AlN and $Y_4Al_2O_9$ wherein the total amount of said $Y_4Al_2O_9$ phase ranges from about 6.0% by volume to about 12.7% by volume of the total volume of said body, said

body having a porosity of less than about 10% by volume of said body and a thermal conductivity greater than 1.0 W/cm·K at 22° C.

4,547,472

METHOD OF ADDING AN ALKALINE EARTH METAL TO A ZEOLITIC CATALYST

Robert A. Van Nordstrand, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 29, 1984, Ser. No. 614,889
Int. Cl.[4] B01J 29/12
U.S. Cl. 502—66 8 Claims

7. A method of forming a zeolitic catalyst comprising:
(a) mixing a potassium-type L zeolite with an inorganic binder selected from the group consisting of silica, alumina, and aluminosilicates;
(b) extruding said mixture through a die to form cylindrical pellets;
(c) drying and calcining said pellets;
(d) contacting said calcined pellets with a barium nitrate solution at a temperature of from 25° C. to 100° C., at a pH of from 8 to 11, over a period of time of from 20 minutes to 4 hours;
(e) drying said contacted pellets at a temperature of from 70° C. to 130° C.;
(f) calcining said dried barium-type L zeolite-inorganic oxide pellets at a temperature of from 550° C. to 650° C.;
(g) contacting said calcined barium-type L zeolite-inorganic oxide pellets with said barium nitrate solution at a temperature of from 25° C. to 100° C., at a pH of from 8 to 11, over a period of time of from 20 minutes to 4 hours;
(h) drying and calcining said doubly contacted pellets;
(i) impregnating said doubly contacted pellets with platinum using tetrammineplatinum (II) nitrate;
(j) drying and calcining said impregnated pellets; and
(k) reducing said calcined platinum-barium-type L zeolite-inorganic oxide pellets in hydrogen at 480° C. to 500° C.

4,547,473

PROCESS FOR THE PREPARATION OF POLYMERS OF ALPHA-OLEFINS AT HIGH TEMPERATURES

Michael A. Hamilton, and Vaclav G. Zboril, both of Kingston, Canada, assignors to Du Pont Canada Inc., Montreal, Canada

Division of Ser. No. 335,633, Dec. 30, 1981, Pat. No. 4,431,784.
This application Oct. 27, 1983, Ser. No. 546,156
Claims priority, application Canada, Jan. 6, 1981, 367952
Int. Cl.[4] C08F 4/64
U.S. Cl. 502—113 9 Claims

1. A coordination catalyst for a process for the preparation of high molecular weight polymers of α-olefins selected from the group consisting of homopolymers of ethylene and copolymers of ethylene and higher α-olefins, said catalyst being in inert solvent and being prepared by combining a first component with a second component, said first component being obtained by admixing rapidly a solution of an organoaluminum compound in inert hydrocarbon solvent with a solution of titanium tetrahalide in inert solvent at a temperature of less than 30° C. and heating the resultant admixture to a temperature of 150°–300° C. for a period of from 10 seconds to 10 minutes, said organoaluminum compound being of the formula AlR_nX_{3-n} and being admixed with the titanium compound so that the atomic ratio of aluminum to titanium in the first component is in the range 0.2–2.0, said second component being a solution of organoaluminum compound in inert hydrocarbon solvent in which the organoaluminum compound is, independently, also of the formula AlR_nX_{3-n}, said first and second components being combined so that the atomic ratio of aluminum in the second component to titanium is in the range 0.9 to 3; where R is alkyl, cycloalkyl, aryl or alkyl-substituted aryl and has 1–20 carbon atoms, n=1, 1.5, 2 or 3 and X is halogen, said catalyst components being mixed in-line and fed to a polymerization reactor without separation of any fraction therefrom.

9. The catalyst of claim 1 in which the solution of titanium tetrahalide contains vanadium oxytrihalide such that the atomic ratio of aluminum to titanium plus vanadium in the first component is in the range 0.2–2.0 and the atomic ratio of aluminum in the second component to titanium plus vanadium is in the range 0.9–3.0.

4,547,474

SUPPORTED SUPERACIDIC CATALYSTS BASED ON C_{10} TO C_{18} PERFLUORINATED ALKANESULFONIC ACIDS

George A. Olah, Beverly Hills, Calif., assignor to Atochem, Courbevoie, France

Continuation-in-part of Ser. No. 164,951, Jul. 1, 1980, abandoned, which is a continuation of Ser. No. 23,676, Mar. 26, 1979, abandoned. This application Jan. 3, 1984, Ser. No. 568,272
Int. Cl.[4] B01J 31/26, 31/36
U.S. Cl. 502—168 4 Claims

1. An effective, supported solid superacidic catalyst composition for hydrocarbon transformations comprising a C_4 to C_{18} perfluorinated alkanesulfonic acid deposited or absorbed on a suitable carrier and having bonded thereto from between about 1 to about 50 percent by weight of the total catalyst composition of a Lewis acid fluoride selected from the elements of Group IIA, IIIA, IVB, VA, VB or VIB of the Periodic Table.

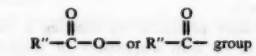
4,547,475

MAGNESIUM HALIDE CATALYST SUPPORT AND TRANSITION METAL CATALYST PREPARED THEREON

Sarah M. Glass, Richwood, and Morris S. Edmondson, Alvin, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 7, 1984, Ser. No. 648,423
Int. Cl.[4] C08F 4/62, 4/64, 4/63
U.S. Cl. 502—115 24 Claims

5. In a magnesium halide supported transition metal catalyst comprising a magnesium halide and a transition metal component; the improvement which comprises employing as the magnesium halide support that which is prepared by contacting in the absence of an electron donor a magnesium component represented by the formula $R_2Mg.xAlR'_3$ wherein each R is independently a hydrocarbyl or hydrocarbyloxy group having from 1 to about 20 carbon atoms, each R′ is independently a halide, a hydrocarbyl or hydrocarbyloxy group having from 1 to about 20 carbon atoms,



wherein R″ is a hydrocarbyl or hydrocarbyloxy group having from about 1 to about 20 carbon atoms and x has a value such that the atomic ratio of Al:Mg is from about 0.025:1 to about 0.25:1 with a non-metallic halide source in a manner such that the reaction temperature does not exceed 25° C.

4,547,476

CATALYST COMPONENT FOR THE POLYMERIZATION OF OLEFINS AND CATALYST THEREFOR

Minoru Terano, Chigasaki; Hirokazu Soga, Kanagawa; Masuo Inoue, and Katsuyoshi Miyoshi, both of Chigasaki, all of Japan, assignors to Toho Titanium Co., Ltd., Tokyo, Japan

Filed May 23, 1984, Ser. No. 613,178
Claims priority, application Japan, Jul. 20, 1983, 58-130873
Int. Cl.[4] C08F 4/64
U.S. Cl. 502—127 18 Claims

1. A catalyst component (A) for the polymerization of olefins obtained by a process comprising contacting (a) a fatty acid salt of magnesium and (b) dialkoxymagnesium, (c) mono or diester of an aromatic dicarboxylic acid, (d) a halogenated hydrocarbon, and (e) a titanium halide of the general formula: TiX_4, wherein X represents a halogen atom, said catalyst component being used in combination with (B) a silicon compound represented by the general formula: $SiR_m(OR')_{4-m}$, wherein R is hydrogen, alkyl group, or aryl group, R' is alkyl group or aryl group, and m is represented as $0 \leqq m \leqq 4$, and with (C) an organoaluminium compound.

4,547,477

ORGANOMAGNESIUM SOLUTIONS OF LOW VISCOSITY

Dennis B. Malpass, LaPorte, and Dale W. Webb, Pasadena, both of Tex., assignors to Texas Alkyls, Inc., Deer Park, Tex.

Filed Mar. 21, 1984, Ser. No. 591,717
Int. Cl.[4] B01J 31/12; C07F 3/02; C08F 4/62
U.S. Cl. 502—153 11 Claims

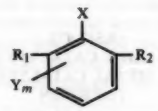
1. A hydrocarbon solution of a dialkylmagnesium compound having reduced viscosity, which solution comprises:

(a) a hydrocarbon solvent;

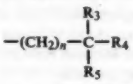
(b) a dialkylmagnesium compound normally soluble in hydrocarbon solvents; and

(c) an effective viscosity reducing amount of:

(i) a benzene derivative having the formula



in which X is hydroxy, amino, or mono- or di-lower alkylamino; R_1 and R_2 are independently phenyl, mono- or polysubstituted phenyl in which the substituents are substantially non-reactive towards magnesium or dialkylmagnesium compounds, or a tertiary alkyl group having the formula



in which n is zero or 1 and R_3, R_4 and R_5 are independently methyl or ethyl; Y is hydrogen or a substituent which is substantially non-reactive towards magnesium and- dialkylmagnesium compounds, and m is an integer from 1 to 3;

(ii) a substance produced by reacting a compound as defined in (i) with magnesium or dialkylmagnesium compounds; or

(iii) a mixture of a substance as defined in (i) or (ii) with an organoaluminum viscosity reducing agent;

wherein the mole ratio of magnesium to substance (i) and/or (ii) is at least 8.5:1.

2. A hydrocarbon solution according to claim 1 in which the viscosity reducing agent is a benzene derivative substituted at the 2- and 6- positions by tertiary alkyl groups.

3. A hydrocarbon solution according to claim 2 in which the benzene derivative is 2,6-di-tert-butylphenol.

4,547,478

CATALYST SYSTEMS FOR POLYURETHANE COMPOSITIONS

Eugene Y. C. Chang, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Mar. 9, 1984, Ser. No. 588,015
Int. Cl.[4] B01J 31/04, 31/12
U.S. Cl. 502—154 5 Claims

1. A composition for the catalysis of reaction between an aliphatic hydroxyl-containing compound and a hindered aliphatic secondary or tertiary isocyanate group containing compound, said catalyst composition comprising

(i) 1,8-diazabicyclo(5.4.0)-undecene-7 or a salt thereof;

(ii) a dialkyl tin dicarboxylate and, optionally,

(iii) a divalent lead salt of an organic acid, the weight ratios of (i):(ii):(iii) being in the range, respectively, of from about 0.5:1:0 to about 2:1:3.

4,547,479

POLYPHOSPHATE IN CHROMIUM CATALYST SUPPORT

Marvin M. Johnson, and Max P. McDaniel, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 2, 1984, Ser. No. 626,944
Int. Cl.[4] C08F 4/02, 4/24, 4/62; B01J 27/18
U.S. Cl. 502—155 32 Claims

1. A catalyst comprising:

a zerovalent organochromium compound on a predominantly aluminum polyphosphate support said zerovalent organochromium compound being present in an amount sufficient to give 0.001 to 10 weight percent chromium based on the weight of said support plus said chromium compound.

6. A catalyst according to claim 1 comprising in addition an organoaluminum or organoboron cocatalyst in an amount so as to give an atom ratio of aluminum or boron to chromium within the range of 0.1:1 to 10:1, said catalyst being further characterized by having said chromium compound present in an amount sufficient to give 0.1 to 5 weight percent chromium based on the weight of said support plus said chromium compound.

10. A catalyst system comprising a chromium component selected from chromium oxide and organochromium compounds on a support comprising alumina impregnated with a polyphosphoric acid composition, said chromium component being present in an amount sufficient to give 0.001 to 10 weight percent chromium based on the weight of said support plus said chromium component.

4,547,480

CATALYST PRECURSOR PREPARED FROM MANGANESE CARBONATE AND A MAGNESIUM COMPOUND

James G. Bennett, Jr., Glenmont, N.Y., and Freddie L. Tungate, Georgetown, Ind., assignors to General Electric Company, Selkirk, N.Y.

Filed Dec. 20, 1983, Ser. No. 563,311
Int. Cl.[4] B01J 23/02, 27/20, 31/06
U.S. Cl. 502—159 10 Claims

1. A catalyst precursor capable of being calcined to an active catalyst, comprising a dry admixture of

(a) manganese carbonate; and

(b) one or more magnesium-containing materials selected from the group consisting of magnesium carbonate, basic magnesium carbonate and magnesium hydroxide.

4,547,481

PROCESS FOR THE POLYMERIZATION OF ETHYLENICALLY UNSATURATED MONOMERS

Claes O. A. Lundin, Saltsjö-Boo, and Berit I. Simonsson, Solna, both of Sweden, assignors to KenoGard AB, Stockholm, Sweden

Division of Ser. No. 402,276, Jul. 27, 1982, Pat. No. 4,499,250, which is a continuation of Ser. No. 228,950, Jan. 27, 1981, abandoned. This application Jul. 17, 1984, Ser. No. 631,785
Claims priority, application Sweden, Jan. 28, 1980, 8000669
The portion of the term of this patent subsequent to Nov. 15, 2000, has been disclaimed.
Int. Cl.[4] B01J *31/02*
U.S. Cl. 502—160 8 Claims

1. An aqueous dispersion of a solid, monomer-soluble, free-radical forming initiator, which dispersion is suitable for the polymerization of vinyl chloride monomers or vinyl chloride and up to 20% by weight, based on the vinyl chloride, of copolymerizable monomers in aqueous systems, said initiator dispersion containing an emulsifier consisting essentially of an ethoxylated nonionic emulsifier with an HLB-value above 15, which ethoxylated nonionic emulsifier is at least one ethoxylated fatty alcohol or at least one ethoxylated fatty acid, in an amount of at least 1 percent by weight based on the initiator.

2. A dispersion according to claim 1 wherein the ethoxylated nonionic emulsifer has an HLB-value above 17.

4. A dispersion according to claim 2 wherein the initiator is an organic peroxide.

4,547,482

CATALYST COMPOSITION SUITED FOR SYNTHESIS OF METHANOL

Minoru Osugi; Tadasi Nakamura, and Shuji Ebata, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jul. 20, 1983, Ser. No. 515,933
Claims priority, application Japan, Jul. 21, 1982, 57-127296
Int. Cl.[4] B01J *23/80, 27/18*
U.S. Cl. 502—208 11 Claims

1. A catalyst composition for the vapor phase production of methanol from carbon monoxide and/or carbon dioxide and hydrogen consisting essentially of copper oxide, zinc oxide and an oxyacid of phosphorus or its salt.

4,547,483

CATALYSTS FOR FLUORINATION AND/OR DISMUTATION REACTIONS ON HALOGENATED HYDROCARBONS, AND A PROCESS FOR THEIR PREPARATION

Thomas Müller, Bad Homburg, and Günter Siegemund, Hofheim am Taunus, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 27, 1984, Ser. No. 624,936
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1983, 3323374
Int. Cl.[4] B01J *27/12, 21/18;* C07C *17/20, 19/08*
U.S. Cl. 502—226 6 Claims

1. A process for preparing a chromium-and magnesium-containing catalyst for fluorination reactions by precipitating chromium (III) hydroxide, which comprises reacting 1 mole of a water-soluble chromium (III) salt with at least 1.5 moles of magnesium hydroxide or magnesium oxide in the presence of water, converting the reaction mixture into a paste which contains chromium hydroxide and a magnesium salt, drying the paste and treating it at temperatures of 20° to 500° C. with at least two moles of hydrogen fluoride per mole of metal compound, chromium (III) salt plus magnesium hydroxide or oxide, in the starting material.

3. The process as claimed in claim 1, wherein 12 to 24 moles of magnesium oxide or magnesium hydroxide are used per mole of chromium(III) salt.

6. A chromium- and magnesium-containing catalyst made according to claim 1, which comprises at least 55% by weight of magnesium fluoride and 0.5 to 29% by weight of chromium, present in the form of a chromium compound, the atomic ratio of magnesium to chromium being between 1.5 and 50.

4,547,484

METHOD OF PREPARING A CATALYST FOR THE OXIDATION AND AMMOXIDATION OF OLEFINS

Tao P. Li, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 598,130, Apr. 9, 1984, Pat. No. 4,487,850, which is a continuation-in-part of Ser. No. 568,774, Jan. 6, 1984, abandoned, which is a continuation-in-part of Ser. No. 430,053, Sep. 30, 1982, abandoned. This application Sep. 26, 1984, Ser. No. 654,428
The portion of the term of this patent subsequent to Dec. 11, 2001, has been disclaimed.
Int. Cl.[4] B01J *23/84, 23/88*
U.S. Cl. 502—249 14 Claims

1. A method of preparing a catalyst containing antimony, uranium, iron, bismuth, and molybdenum in a catalytically active oxidized state useful for the oxidation and ammoxidation of olefins represented by the empirical formula:

$$Sb_aU_bFe_cBi_dMo_eO_f$$

where a is 1 to 10, b is 0.1 to 5, c is 0.1 to 5, d is 0.001 to 0.1, e is 0.001 to 0.2, f is a number taken to satisfy the valence requirements of Sb, U, Fe, Bi, and Mo in the oxidation states in which they exist in the catalyst, comprising

(a) preparing a hydrated mixed oxides component containing antimony, uranium, iron, and bismuth by the steps of
  (i) forming a mixture of oxides or nitrates of bismuth and uranium and an oxide of antimony in nitric acid,
  (ii) heating the mixed oxides mixture at a temperature and for a time sufficient to induce formation of crystalline oxides of antimony,
  (iii) adding an aqueous solution of ferric nitrate to the mixed oxides mixture,
  (iv) adjusting the pH of the mixed oxides mixture to about 8, thereby forming a hydrated mixed oxide precipitate in an aqueous phase,
  (v) separating the hydrated mixed oxides from the aqueous phase;
(b) forming an aqueous slurry of the hydrated mixed oxides component;
(c) adjusting the pH of the hydrated mixed oxides component slurry to about 9;
(d) adding a molybdate to the hydrated mixed oxides component slurry;
(e) adjusting the pH of the hydrated mixed oxides component—molybdate component slurry to about 8–9;
(f) forming the hydrated mixed oxides component—molybdate component slurry into dry particles; and
(g) calcining the dry particles to form the active catalyst.

4,547,485

DEMETALATION CATALYST AND A METHOD FOR ITS PREPARATION

Emmerson Bowes, Hopewell, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 490,074, Apr. 29, 1983, abandoned. This application Sep. 27, 1984, Ser. No. 654,901
Int. Cl.[4] B01J *21/04, 23/85*
U.S. Cl. 502—314 5 Claims

1. A method for preparing an alumina comprising the steps of:

(a) heating an uncalcined alpha-alumina monohydrate to a temperature of about 1400° F. to provide a calcined alumina product;
(b) mixing said calcined alumina product with about 25 to about 185 percent of its own weight on an anhydrous basis of uncalcined alpha-alumina monohydrate; and

(c) heating the resultant mixture to a temperature of about 1400° F.

4,547,486

CATALYST AND METHOD OF PREPARING CATALYST

Yen-Shin Shyr, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 3, 1984, Ser. No. 637,623
Int. Cl.[4] B01J *21/04, 23/44*
U.S. Cl. 502—333 21 Claims

1. A process for preparing a skin catalyst comprising;

(a) immersing a porous support in a presoak liquid for a length of time sufficient to fill the interior of each support particle,

(b) withdrawing the support particle of (a) and removing the excess liquid,

(c) impregnating the support particles of (b) with an impregnating metal compound solution that is substantially immiscible with and has a surface tension that is at least about 5 dyne/cm @ 20° C. lower than the presoak liquid, and

(d) drying and treating to activate the catalyst thereby producing a skin catalyst.

4,547,487

PROCESS FOR PREPARING CATALYSTS

Roger F. Vogel, Butler; Raymond J. Rennard, Oakmont, and Joseph A. Tabacek, New Kensington, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed May 19, 1983, Ser. No. 495,968
Int. Cl.[4] B01J *21/04, 21/06, 23/30*
U.S. Cl. 502—351 12 Claims

1. A process for preparing catalysts of increased activity which comprises mixing alumina with (1) at least one solid metal compound selected from the group consisting of TiO_2, $TiO_2.xH_2O$, Ti_2O_3, ZrO_2, $ZrO_2.xH_2O$, HfO_2, and WO_3 and (2) thereafter mixing the alumina and metal compound mixture with an aqueous solution containing at least one dissolved compound therein that imparts to said aqueous solution a pH below 6, the resulting mixture containing from 20 to 60 weight percent alumina, 0.5 to 10 weight percent of said solid metal compound, 30 to 75 weight percent water, and 0.01 to 2 weight percent of said dissolved compound, drying, and calcining the alumina having the metal compound deposited thereon.

4,547,488

ANTIBIOTIC M43D, PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE

Kurt E. Merkel, Mooresville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 16, 1984, Ser. No. 600,725
Int. Cl.[4] A61K *37/02, 31/71;* C07H *15/20*
U.S. Cl. 514—10 8 Claims

5. A composition useful for treating gram-positive bacterial infections comprising an effective antibacterial amount of antibiotic M43D or a pharmaceutically acceptable salt of M43D together with a suitable vehicle.

6. A method for treating infections caused by gram-positive bacteria which comprises administering an effective amount of a composition of claim 5 to an animal.

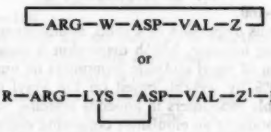
4,547,489

CONFORMATIONALLY RESTRICTED THYMOPENTIN-LIKE COMPOUNDS

Gideon Goldstein, Short Hills; George Heavner, Flemington; Tapan Audhya, Bridgewater, and Foe-Siong Tjoeng, Neshanic Station, all of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Jun. 11, 1984, Ser. No. 618,968
Int. Cl.[4] A61K *37/00;* C07C *103/52*
U.S. Cl. 514—11 9 Claims

1. A peptide having the formula:



or a pharmaceutically-acceptable acid- or base-addition salt thereof, wherein:

R is H, loweralkyl, formyl or loweralkanoyl;

W is LYS, PRO, dehydro-PRO, or AIB;

Z is TYR, TYR-GLY, PHE, or PHE-GLY;

Z^1 is TYR or PHE;

R^1 is OH or NR^2R^3; and

R^2 and R^3 are each independently selected from H or loweralkyl.

4,547,490

SYNTHETIC WHOLE BLOOD AND A METHOD OF MAKING THE SAME

Charles S. Ecanow, Skokie, and Bernard Ecanow, Wilmette, both of Ill., assignors to Neomed, Inc., Wilmette, Ill.

Continuation-in-part of Ser. No. 372,393, Apr. 27, 1982, abandoned. This application Jul. 12, 1983, Ser. No. 512,917
Int. Cl.[4] A61K *37/00, 31/685*
U.S. Cl. 514—21 19 Claims

1. A method of preparing a synthetic whole blood substitute comprising the steps of:

(A) dispersing an amount of albumin in a solution comprised of distilled water, about 0.9% weight to volume of a salt, from about 1% to about 5% weight to volume of urea and from about 0.1% to about 10% weight to volume of a phospholipid, as will result in about 5 to 25% weight to volume albumin in the final solution,

(B) adding a non-polar solvent to the solution until globules of a coacervate phase of an aqueous two phase system begin to appear,

(C) storing the solution, undisturbed at a temperature of from about 4° to 10° C., for at least 12 hours, thereby producing the two phase coacervate system, comprising an aqueous coacervate phase and an equilibrium bulk water phase,

(D) removing said coacervate system from storage, allowing it to reach room temperature, then adding an amount of distilled water as will result in about 5 to 25% weight to volume of albumin, and

(E) adding a sufficient amount of a salt to said coacervate system as will render it isotonic with whole human blood.

14. A synthetic whole blood substitute comprising an aqueous solution of about 0.9% weight to volume of a salt, from about 1% to about 5% weight to volume urea, from about 0.1% to about 10% weight to volume of a phospholipid, and from about 5 to 25% by weight to volume albumin, said components forming a two phase coacervate system having a coacervate phase and an equilibrium bulk water phase, and including a non-polar solvent selected from alcohols, esters, ketones, substituted glycerols or substituted hydrocarbons sufficient to promote formation of said two phase coacervate system.

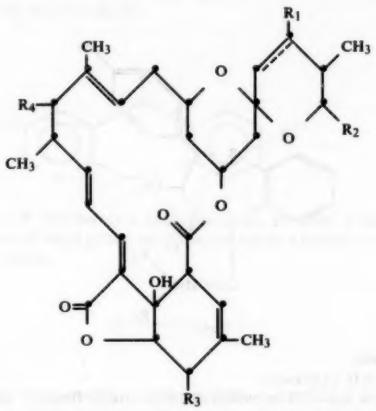
4,547,491

C-8A-OXO-AVERMECTIN AND MILBEMYCIN DERIVATIVES, PHARMACEUTICAL COMPOSITIONS AND METHOD OF USE

Helmut H. Mrozik, Matawan, and Frank S. Waksmunski, South River, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 18, 1984, Ser. No. 632,094
Int. Cl.[4] A61K *31/70*; C07H *17/08*; C07D *493/22*
U.S. Cl. 514—30 **18 Claims**

1. A compound having the formula:



wherein the broken line indicates a single or a double bond; wherein

R_1 is H, loweralkanoyloxy, —OH or =O provided that R_1 is present only when the broken line indicates a single bond;

R_2 is methyl, ethyl, isopropyl or sec-butyl;

R_3 is OH, OCH_3 or loweralkanoyloxy;

R_4 is H, —OH, loweralkanoyloxy, α-L-oleandrosyloxy, 4'-(α-L-oleandrosyl)-α-L-oleandrosyloxy, 4'-loweralkanoyl-α-L-oleandrosyloxy, or 4''-loweralkanoyl-4'-(α-L-oleandrosyl)-α-L-oleandrosyloxy; and the tri(loweralkyl)silyl protected hydroxy derivatives thereof.

15. A method for the treatment of parasitic infections which comprises administering to an animal infected with parasites an effective amount of a compound of claim **1**.

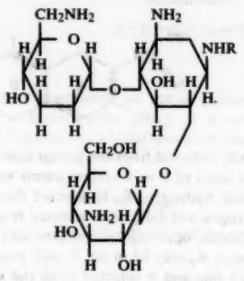
4,547,492

1-N-(ω-AMINO-α-HYDROXYALKANOYL-2',3'-DIDEOXYKANAMYCIN A AND PHARMACEUTICAL COMPOSITION CONTAINING SAME

Hamao Umezawa; Sumio Umezawa, both of Tokyo; Tsutomu Tsuchiya; Toshio Yoneta, both of Yokohama, and Shunzo Fukatsu, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Japan

Filed Aug. 10, 1984, Ser. No. 639,392
Claims priority, application Japan, Aug. 15, 1983, 58-147965
Int. Cl.[4] A61K *31/71*; C07H *15/22*
U.S. Cl. 514—41 **4 Claims**

1. A compound represented by the formula



(I)

wherein R denotes an L-3-amino-2-hydroxypropionyl group or an L-4-amino-2-hydroxybutyryl group, and a pharmaceutically acceptable acid addition salt thereof.

4. An antibacterial composition comprising as the active ingredient antibacterially effective amounts of the compound of the formula (I) as defined in claim **1** or a pharmaceutically acceptable acid addition salt thereof, in combination with a carrier for the active ingredient compound.

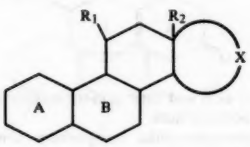
4,547,493

NOVEL 11β-SUBSTITUTED-19-NOR-STEROIDS

Jean-Georges Teutsch, Pantin; Vesperto Torelli, Maisons-Alfort; Roger Deraedt, Pavillons-sous-Bois, and Daniel Philibert, La Varenne-Saint-Hilaire, all of France, assignors to Roussel Uclaf, Paris, France

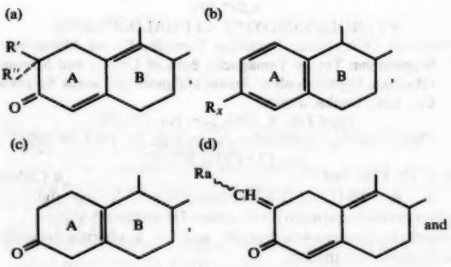
Filed Jun. 6, 1983, Ser. No. 501,373
Claims priority, application France, Jun. 11, 1982, 82 10205
The portion of this patent subsequent to May 31, 2000, has been disclaimed.
Int. Cl.[4] C07J *1/00*; A61K *31/56*
U.S. Cl. 514—179 **44 Claims**

1. A compound selected from the group consisting of 19-nor-steroids of the formula

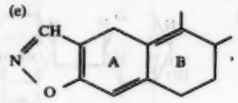


I

wherein R_1 is an organic group of 1 to 18 carbon atoms optionally containing at least one atom selected from the group consisting of oxygen, sulfur, nitrogen, phosphorus and silicon with the atom immediately adjacent the 11-carbon atom being carbon, R_2 is a hydrocarbon of 1 to 8 carbon atoms, X is the remainder of a pentagonal or hexagonal ring optionally substituted and optionally containing one unsaturated bond, the A and B rings are selected from the group consisting of

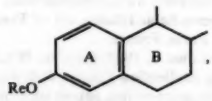


-continued

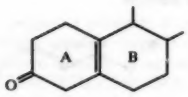


R' and R" are individually selected from the group consisting of hydrogen, —CN and alkyl of 1 to 4 carbon atoms with at least one being other than hydrogen, R_x is selected from the group consisting of hydrogen and OR_e, R_e is selected from the group consisting of hydrogen, optionally substituted alkyl of 1 to 6 carbon atoms and acyl, R_a may be in the E or Z positions as indicated by the wavy line and is selected from the group consisting of

and acyloxy R_a' and R_a'' are alkyl of 1 to 4 carbon atoms or taken together with the nitrogen atom form a heterocycle of 5 to 6 chain members optionally containing another heteroatom with the proviso that when A and B are



R_1 contains at least one nitrogen, phosphorus or silicium atom and when A and B are



R_1 is not a linear akyl and their non-toxic, pharmaceutically acceptable acid addition salts.

18. An antiglucocorticoidal composition comprising an antiglucocorticoidally effective amount of at least one compound of claim 1 and an inert pharmaceutically carrier.

4,547,494

PYRROLIDOMOXINE CEPHALOSPORINS

Toyonari Oine, Nara; Yoshihisa Yamada, Kyoto; Mitsuyoshi Wagatsuma; Totaro Yamaguchi, both of Urawa, and Satoshi Ohshima, Iwatsuki, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Feb. 9, 1984, Ser. No. 578,380

Claims priority, application Japan, Feb. 22, 1983, 58-29063

Int. Cl.[4] C07D *501/60*

U.S. Cl. 514—204 **6 Claims**

1. A 7β-{(Z)-2-(2-aminothiazol-4-yl)-2-[(2-pyrrolidon-3-yl)oxyimino]acetamido}-5-(1-amino-1H-tetrazol-5-yl)thiomethyl-3-cephem-4-carboxylic acid or a pharmaceutically acceptable salt thereof.

4,547,495

1,5-BENZOTHIAZEPINES WITH CARDIOVASCULAR UTILITY, AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Stefano Maiorana, Milan; Diego G. Brocchetti, Brescia, and Giuseppe Piacenza, Turin, all of Italy, assignors to Schiapparelli Farmaceutici S.p.A., Turin, Italy

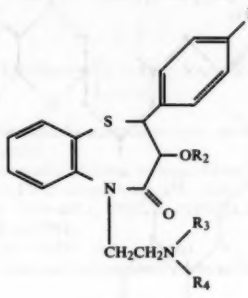
Filed Jul. 9, 1984, Ser. No. 628,730

Claims priority, application Italy, Jul. 22, 1983, 22185 A/83

Int. Cl.[4] C07D *417/12;* **A61K** *31/55*

U.S. Cl. 514—211 **15 Claims**

1. A 1,5-benzothiazepine compound of formula



I

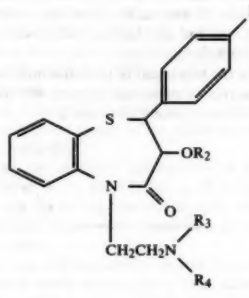
wherein:

R_1 is (C_{1-4})alkoxy;

R_2 is R_5—CO in which R_5 is pyrrolyl, furanyl, thienyl, pyridyl, quinolyl, pyrrolidinyl or piperidinyl;

R_3 and R_4 independently are (C_{1-4})alkyl and salts thereof with a pharmaceutically acceptable acid.

7. A pharmaceutical composition useful in the treatment of coronary diseases which contains about 50 to about 150 mg of an active ingredient which is a 1,5-benzothiazepine of formula



I

wherein:

R_1 is (C_{1-4})alkoxy;

R_2 is

in which R_5 is pyrrolyl, furanyl, thienyl, pyridyl, quinolyl, pyrrolidinyl or piperidinyl;

R_3 and R_4 independently are (C_{1-4})alkyl and salts thereof with a pharmaceutically acceptable acid,

in admixture with at least one solid or liquid carrier.

4,547,496

ANTIULCER [1] BENZEPINO[3,4-b]PYRIDINE AND COMPOSITIONS

Toshiaki Kumazawa; Yoshimasa Oiji; Hiroshi Tanaka, and Katsuichi Shuto, all of Shizuoka, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

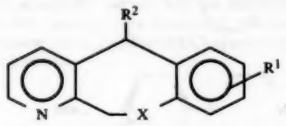
Filed Jun. 21, 1984, Ser. No. 623,084

Claims priority, application Japan, Jun. 24, 1983, 58-113831; Oct. 5, 1983, 58-186129; Oct. 21, 1983, 58-196976

Int. Cl.[4] **A61K** *31/44, 31/535;* **C07D** *491/044, 495/04*

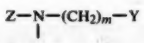
U.S. Cl. 514—218 **26 Claims**

1. A novel [1]benzepino[3,4-b]pyridine derivative represented by the formula (I):

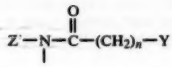


(I)

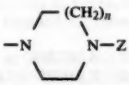
wherein R^1 represents a hydrogen atom, an alkyl group, a halogenated alkyl group, an alkoxy group or a halogen atom; R^2 represents



wherein Y represents an amino group, a substituted amino group, a heterocyclic group or a substituted heterocyclic group; Z represents a hydrogen atom, an alkyl group or an acyl group; and m is an integer of 1–3,

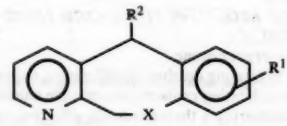


wherein Z' represents a hydrogen atom or an alkyl group; Y has the same meaning as defined above, and n is 0, 1 or 2; or



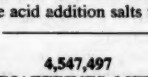
wherein Z and n have the same meanings as defined above; X represents an oxygen atom or a sulfur atom; and the pharmaceutically acceptable acid addition salts thereof.

14. A pharmaceutical composition comprising a pharmaceutical carrier and, as an active ingredient, an effective amount of a novel [1]benzepino[3,4-b]pyridine derivative represented by formula (I)

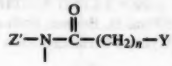


(I)

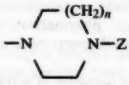
wherein R^1 represents a hydrogen atom, an alkyl group, a halogenated alkyl group, an alkoxy group or a halogen atom; R^2 represents



wherein Y represents an amino group, a substituted amino group, a heterocyclic group or a substituted heterocyclic group; Z represents a hydrogen atom, an alkyl group or an acyl group; and m is an integer of 1–3,



wherein Z' represents a hydrogen atom or an alkyl group; Y has the same meaning as defined above, and n is 0, 1 or 2; or



wherein Z and n have the same meanings as defined above; X represents an oxygen atom or a sulfur atom; and the pharmaceutically acceptable acid addition salts thereof.

4,547,497

AMIDINE BENZODIAZEPINES, METHODS FOR THEIR USE AND INTERMEDIATES

Chih Y. Ho, Lansdale, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

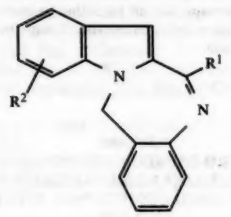
Filed Apr. 11, 1984, Ser. No. 599,095

The portion of the term of this patent subsequent to Jul. 16, 2002, has been disclaimed.

Int. Cl.[4] **A01N** *43/84, 43/48, 43/40;* **C07D** *210/00*

U.S. Cl. 514—219 **20 Claims**

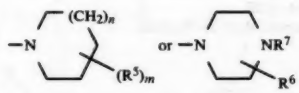
1. A benzodiazepine of the following formula (I):



(I)

wherein

R^1 is an amine function of the formula $—NR^3R^4$, 4-morpholino,



R^2 is hydrogen, alkoxy, alkyl, trifluoromethyl, halogen, nitro, hydroxy or dialkylamino;

R^3 and R^4 are independently hydrogen, alkyl or alkyl substituted by hydroxy, halogen or alkoxy;

m is 0 or 1;

n is 0, 1 or 2;

R^5 is hydroxy, alkyl, halogen, carboxy, alkoxycarbonyl or alkyl substituted by hydroxy, halogen, alkoxy or phenyl;

R^6 is hydrogen, alkyl, carboxy, alkoxycarbonyl or phenyl; and

R^7 is hydrogen, alkyl, alkoxycarbonyl or alkyl substituted by hydroxy, halogen, alkoxy, phenoxy or alkoxycarbonyl; and the pharmaceutically acceptable salts thereof.

4,547,498

PHARMACEUTICAL COMBINATION COMPOSITION AND ASSOCIATED METHOD

Cheryl D. Blume, and Paul H. Bonner, both of Morgantown, W. Va., assignors to Mylan Pharmaceuticals Inc., Morgantown, W. Va.

Division of Ser. No. 456,311, Jan. 6, 1983, Pat. No. 4,444,769, which is a continuation-in-part of Ser. No. 402,279, Jul. 27, 1982, abandoned. This application Feb. 17, 1984, Ser. No. 581,411

Int. Cl.[4] A61K *31/54, 31/505*

U.S. Cl. 514—225 **9 Claims**

1. A method for forming a granularly-heterogenous composition having combined pharmaceutically-effective diuretic anti-hypokalemic and antihypertensive activity comprising the steps of

mixing finely-divided particles of a triamterene-active pteridine ingredient with at least one finely-divided pharmaceutically-acceptable inert ingredient to form a first mixture, and granulating said first mixture to form first granules composed of a homogeneous blend of the particles of said first mixture;

separately mixing finely-divided particles of a hydrochlorothiazide-active benzothiadiazide ingredient with at least one finely-divided pharmaceutically-acceptable inert ingredient to form a second mixture, and separately granulating said second mixture to form second granules composed of a homogeneous blend of the particles of said second mixture;

thereafter physically blending together said thusformed first and second granules while substantially retaining the respective identities of said first and second granules, in respective amounts such that in the resulting blended composition the weight ratio of said pteridine ingredient to said benzothiadiazide ingredient provides an effective bioavailable amount of said pteridine to control the hypokalemic condition induced by the dosage amount of said benzothiadiazide.

4,547,499

2,4-DIHYDRO-2(OMEGA-AMINOALKYL)-1H-[1,2,4]TRIAZOLO[3,4-C]BENZOXAZIN-1-ONE ANTI-ALLERGY DRUG COMPOUNDS, COMPOSITIONS AND USE

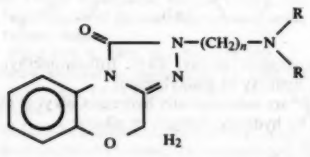
Jackson B. Hester, Jr., Comstock Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 10, 1984, Ser. No. 609,035

Int. Cl.[4] A61K *31/535;* **C07D** *498/04*

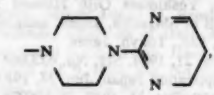
U.S. Cl. 514—235 **14 Claims**

1. A compound of the formula

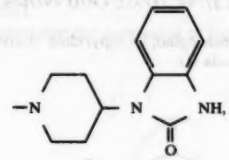


wherein n is 3 or 4;

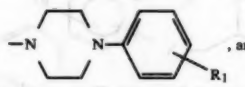
the two R moieties are taken together with the nitrogen to which they are bonded to complete a ring system selected from the group consisting of



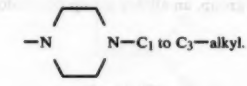
(a)



(b)



(c)



(d)

where R_1 is hydrogen or a halogen having an atomic number of from 9 to 35, or a pharmaceutically acceptable salt thereof.

13. A composition useful in pharmaceutical dosage unit form for treating patients suffering from allergic or hypertensive conditions which comprises a compound according to claim 1 mixed with a pharmaceutical carrier.

4,547,500

ERGOT PEPTIDE DERIVATIVES, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Georg Bolliger, Binningen, Switzerland, and Peter Stütz, Vienna, Austria, assignors to Sandoz Ltd., Basle, Switzerland

Continuation of Ser. No. 340,913, Jan. 20, 1982, abandoned, which is a continuation-in-part of Ser. No. 158,553, Jun. 11, 1980, abandoned. This application May 10, 1983, Ser. No. 493,335

Claims priority, application Switzerland, Jun. 12, 1979, 5476/79; Jun. 12, 1979, 5477/79; Jun. 12, 1979, 5478/79; Jun. 12, 1979, 5479/79

Int. Cl.[4] A61K *31/48, 31/495;* **C07D** *519/02*

U.S. Cl. 514—250 **5 Claims**

1. 2-Methyl-α-ergocryptine.

2. A method of treating cerebral insufficiency, depression, or Parkinsonism or inhibiting prolactin secretion in animals which comprises administering a therapeutically effective amount of a compound of claim 1 to an animal in need of such treatment.

5. A method of increasing vigilance in animals which comprises administering a vigilance increasing effective amount of a compound of claim 1 to an animal in need of said treatment.

4,547,501
METHOD OF USING [1,2,4]TRIAZOLO[4,3-A]QUINOXALINE-4-AMINE DERIVATIVES AS ANTIDEPRESSANT AND ANTIFATIGUE AGENTS

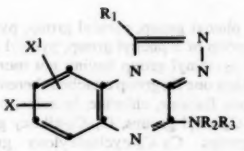
Reinhard Sarges, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 528,361, Sep. 2, 1983, Pat. No. 4,495,187, which is a continuation-in-part of Ser. No. 434,789, Oct. 18, 1982, abandoned. This application Oct. 10, 1984, Ser. No. 659,394

Int. Cl.⁴ A61K *31/50, 31/495*

U.S. Cl. 514—250 **25 Claims**

1. A pharmaceutical composition in unit dosage form for use in the treatment of depression and fatigue comprising a pharmaceutically acceptable carrier and an antidepressant/antifatigue effective amount of a compound selected from the group consisting of [1,2,4]triazolo[4,3-a]quinoxaline-4-amine bases of the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein

X and X^1 are each selected from the group consisting of hydrogen, fluorine, chlorine, bromine and methoxy;

R_1 is selected from the group consisting of hydrogen, lower alkyl, lower perfluoroalkyl and phenyl; and

R_2 and R_3 are each selected from the group consisting of hydrogen, lower alkyl, phenylalkyl having up to three carbon atoms in the alkyl moiety and alkanoyl having from two to five carbon atoms, provided that at least one of X, X^1 and R_1 is always other than hydrogen or lower alkyl when each of R_2 and R_3 is hydrogen or lower alkyl; or

R_2 and R_3, when taken together, complete a piperazino ring.

4,547,502
DIHYDROPYRIDINES AND THEIR USE IN TREATING CARDIAC CONDITIONS AND HYPERTENSION

Simon F. Campbell, Deal; Peter E. Cross, Canterbury, and John K. Stubbs, Deal, all of England, assignors to Pfizer Inc., New York, N.Y.

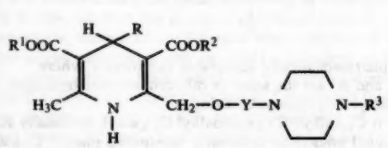
Continuation-in-part of Ser. No. 463,096, Feb. 2, 1983, abandoned. This application Sep. 1, 1983, Ser. No. 528,508

Claims priority, application United Kingdom, Sep. 4, 1982, 8225245

Int. Cl.⁴ A61K *31/495;* **C07D** *401/14, 417/14*

U.S. Cl. 514—253 **7 Claims**

1. A 1,4-dihydropyridine derivative of the formula:



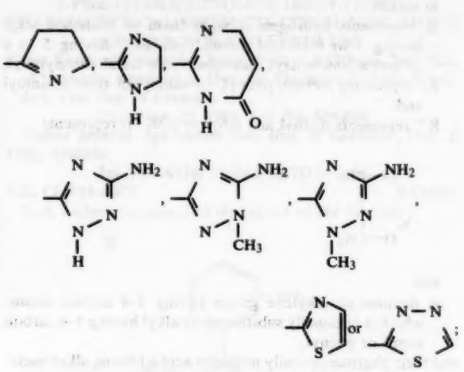
or a pharmaceutically acceptable acid addition salt thereof, wherein:

R is aryl or heteroary;

R^1 and R^2 are each independently C_1–C_4 alkyl or 2-methoxyethyl;

Y is $-(CH_2)_2-$, $-(CH_2)_3-$, $-CH_2CH(CH_3)-$ or $-CH_2C(CH_3)_2-$; and

R^3 is



wherein said aryl group is phenyl; phenyl substituted by one or two substituents selected from the group consisting of nitro, halo, C_1–C_4 alkyl, C_1–C_4 alkoxy, hydroxy, trifluoromethyl, (C_1–C_4 alkoxy)carbonyl and cyano; 1-naphthyl; or 2-naphthyl; and

wherein said heteroaryl group is benzofuranyl; benzothienyl; pyridyl; pyridyl substituted by methyl or cyano; quinolyl; benzoxazoyl; benzthiazolyl; furyl; pyrimidinyl; thiazolyl; 2,1,3-benzoxadiazol-4-yl; 2,1,3-benzthiadiazol-4-yl; thienyl; or thienyl substituted by halo or C_1–C_4 alkyl.

6. A method of treating cardiac conditions which comprises administering a cardiac condition treating effective amount of a compound according to claim 1.

4,547,503
1-CYCLOPROPYL-6-FLUORO-1,4-DIHYDRO-4-OXO-7-[4-(OXO-ALKYL)-1-PIPERAZINYL]QUINOLINE-3-CARBOXYLIC ACIDS AND THEIR DERIVATIVES, AND ANTIBACTERIAL AGENTS CONTAINING THEM

Uwe Petersen, Leverkusen; Klaus Grohe, Odenthal; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

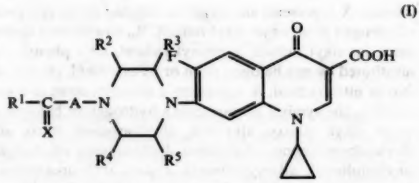
Filed Dec. 9, 1983, Ser. No. 560,026

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1982, 3248505

Int. Cl.⁴ A61K *31/495;* **C07D** *401/04*

U.S. Cl. 514—254 **17 Claims**

1. A 1-cyclopropyl-6-fluoro-1,4-dihydro-4-oxo-7-[4-(oxoalkyl)-1-piperazinyl]quinoline-3-carboxylic acid of the formula (I)



(I)

in which

R^1 denotes hydrogen, straight-chain or branched alkyl having 1 to 4 carbon atoms and phenyl which is optionally substituted 1–3 times by trifluoromethyl, methyl, ethyl, fluorine, chlorine, bromine, phenyl, hydroxyl or alkoxy having 1–4 carbon atoms,

R^2, R^3, R^4 and R^5 can be identical or different and denote hydrogen, methyl, ethyl, n- or i-propyl,

X denotes O, N—O—R', N—NH—R'' and $(OR''')_2$, in which

R' represents hydrogen, straight-chain or branched alkyl having 1 to 6 carbon atoms, cycloalkyl having 5 to 6 carbon atoms, benzyl, chlorobenzyl or tetrahydropyranyl,

R'' represents methyl, phenyl, carbamoyl or thiocarbamoyl and

R''' represents methyl and ethyl or $(OR''')_2$ represents

and

A denotes an alkylene group having 1–4 carbon atoms, which is optionally substituted by alkyl having 1–4 carbon atoms or phenyl,

and their pharmaceutically utilisable acid addition, alkali metal and alkaline earth metal salts and hydrates.

15. A method of combatting bacterial infection in a warm-blooded animal which comprises administering to said animal an antibacterially effective amount of an active compound of claim 1 either alone or in admixture with an inert pharmaceutical carrier or in the form of a medicament.

4,547,504
SUBSTITUTED PHENYL PIPERAZINYL PYRROLIDIN-2-ONES AND RELATED COMPOUNDS USEFUL AS ANTI-DEPRESSANTS AND THEIR USE

Jean-Louis Fabre, Paris; Daniel Farge, Thiais; Claude James, and Daniel Lave, both of Paris, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

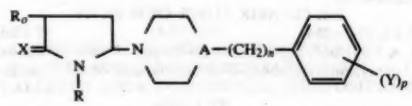
Filed Dec. 6, 1983, Ser. No. 558,775

Claims priority, application France, Dec. 7, 1982, 82 20492

Int. Cl.⁴ C07D *403/04, 401/04;* **A61K** *31/495, 31/445*

U.S. Cl. 514—255 **14 Claims**

1. A pyrrolidine of the formula:



wherein X represents an oxygen or sulphur atom, R represents a hydrogen atom or an alkyl radical, R_o represents a hydrogen atom, an alkyl radical, a phenyl radical, or a phenyl radical substituted by one halogen atom or by one alkyl, alkoxy, alkylthio or nitro radical, A represents a nitrogen atom or a radical =CH—, the symbol Y represents a hydrogen or halogen atom or an alkyl, alkoxy, alkylthio, alkylcarbonyl, nitro, amino, alkylcarbonylamino, alkylamino, dialkylamino, alkylsulphinyl, alkylsulphonyl, alkoxycarbonyl, cyano, trifluoromethyl, hydroxy, mercapto, alkylcarbonyloxy or alkylcarbonylthio radical, n represents zero or 1, and p represents 1, 2 or 3, it being understood that the alkyl and alkoxy radicals, and alkyl and alkoxy moieties of any of the aforementioned groups, contain from 1 to 4 carbon atoms, and when p represents 2 or 3 the atoms or radicals represented by the symbols Y may be the same or different, p having a maximum value of 2 when Y is nitro or hydroxy, or a non-toxic pharmaceutically-acceptable acid addition salt thereof.

4,547,505
N-PHENYL-N'-CYCLOALKYLALKANOYLPIPERAZINE USEFUL AS ANALGETICS AND PROCESS FOR ITS PRODUCTION

Gerhard Oepen, Maintal; Jürgen Engel, Alzenau; Vladimir Jakovlev, Maintal, and Klaus Thiemer, Hanau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

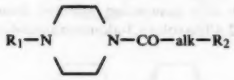
Filed Feb. 24, 1984, Ser. No. 583,324

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1983, 3310871

Int. Cl.⁴ A61K *31/495, 31/505;* **C07D** *403/00, 241/02*

U.S. Cl. 514—255 **10 Claims**

1. A compound of the formula:



where R_1 is a phenyl group, pyridyl group, pyrimidyl group, or pyrazinyl group or a phenyl group, pyridyl group, pyrimidyl group, or pyrazinyl group having not more than one R_3 and not more than one R_4 group attached thereto where R_3 and R_4 are hydrogen, fluorine, chlorine, bromine, trifluoromethyl, hydroxyl, C_1–C_6-alkyl groups, C_1–C_6-alkoxy groups, C_3–C_6-alkenyloxy groups, C_3–C_6-cycloalkyloxy group, phenyl-C_1–C_4-alkoxy groups, C_1–C_6-alkylmercapto groups, the nitro group, the amino group, C_1–C_6-alkylamino groups, C_1–C_6-dialkylamino groups, C_2–C_6-alkanoyl groups, C_2–C_6-alkanoylamine groups or C_2–C_6-alkanoyloxy groups and R_2 is the adamentyl group, the 3,3-dimethylbicyclo[2.2.1]hept-2-yl group or, a saturated C_3–C_7-cycloalkyl group and alk is a C_1–C_6-alkylene chain and the pharmaceutically acceptable salts thereof.

6. A process of treating a mammal in need of an analgetic comprising administering to the mammal an analgesically effective amount of a compound of claim 1.

4,547,506
2-PYRIDYLAMINOAKYLAMINO-4-PYRIMIDONES USEFUL AS HISTAMINE H_1-ANTAGONISTS

Robert J. Ife, Stevenage, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

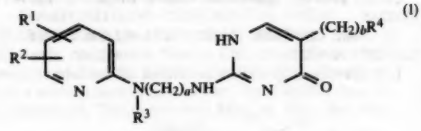
Filed Dec. 20, 1983, Ser. No. 563,495

Claims priority, application United Kingdom, Dec. 23, 1982, 8236638

Int. Cl.⁴ A61K *31/505;* **C07D** *239/02*

U.S. Cl. 514—272 **15 Claims**

1. A compound of formula (1):



(1)

or a pharmaceutically acceptable salt thereof where

R_1 and R^2 are the same or different and are hydrogen, C_{1-6} alkyl C_{1-6} alkoxy, or halogen;

R^3 is C_{1-6} alkyl, C_{3-8} cycloalkyl C_{1-6} alkyl, optionally substituted phenyl or optionally substituted phenyl C_{1-6} alkyl, where the optional substituents are one or two C_{1-6} alkyl, C_{1-6} alkoxy, halogen, or hydroxy groups; or is an optionally substituted pyridyl or optionally substituted pyridyl C_{1-6} alkyl where the optional substituents are one or two C_{1-6} alkyl or C_{1-6} alkoxy groups or halogen atoms;

a is from 2 to 4

b is from 1 to 6

R^4 is hydrogen, optionally substituted phenyl where the

optional substituents are one or two C_{1-6} alkyl, C_{1-6} alkoxy, or hydroxy groups or halogen atoms one nitro group, or a methylenedioxy group, or is an optionally substituted pyridyl group where the optional substituents are one or two C_{1-6} alkyl C_{1-6} alkoxy groups or halogen atoms; or is a C_{3-8} cycloalkyl group, or is N-oxo-3-pyridyl; N-oxo-6-methyl-3-pyridyl; 6-hydroxymethyl-3-pyridyl; N-oxo-4,6-dimethyl-3-pyridyl; 6-hydroxymethyl-4-methyl-3-pyridyl; N-oxo-5,6-dimethyl-3-pyridyl; 6-hydroxymethyl-5-methyl-3-pyridyl; or N-oxo-4-pyridyl, or is a pyridone group in which the nitrogen atom is optionally substituted with C_{1-6} alkyl.

15. A method of blocking histamine H_1-receptors which comprises administering to a subject an effective amount to block said receptors of a compound according to claim 1.

4,547,507
BENZOTHIOPYRANOPYRIDINONES

David A. Rowlands, Malmesbury; Roger J. Gillespie, Swindon; Ian R. Ager, Ashton Keynes; Stephen Clements-Jewery, and Colin R. Gardner, both of Swindon, all of England, assignors to Roussel Uclaf, Paris, France

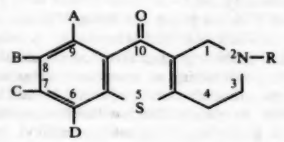
Filed Jul. 12, 1983, Ser. No. 512,964

Claims priority, application United Kingdom, Jul. 14, 1982, 8220433

Int. Cl.[4] C07D *513/14, 513/22;* A61K *31/38*

U.S. Cl. 514—291 27 Claims

1. A compound selected from the group consisting of benzothiopyranopyridinones of the formula



I

wherein A,B,C and D are individually selected from the group consisting of hydrogen, alkyl and alkoxy of 1 to 6 carbon atoms, nitro, halogen, amino and acylamino of a carboxylic acid of 2 to 7 carbon atoms or A and B or C and D taken with the carbon atoms to which they are attached form a benzene ring, R is selected from the group consisting of hydrogen and R', R' is selected from the group consisting of alkyl of 1 to 9 carbon atoms, alkenyl of 2 to 9 carbon atoms, alkenyl of 2 to 9 carbon atoms substituted with an —OH, cycloalkyl of 3 to 9 carbon atoms, phenyl, phenylalkyl of 7 to 9 carbon atoms and $-(CH_2)_n-Z$, n is an integer from 1 to 4, Z is selected from the group consisting of cycloalkyl and cycloalkenyl of 3 to 9 carbon atoms, dioxanyl, 2-oxo-benzimidazolyl, benzoyl, halo substituted benzoyl, cyano, alkoxy carbonyl of 2 to 7 carbon atoms and carbamoyl and their non-toxic, pharmaceutically acceptable acid addition salts.

19. A method of inducing antipyschotic, antidepressant or antidopaminergic activity in warm-blooded animals comprising administering to warm-blooded animals an amount of at least one compound of claim 1 sufficient to induce antipsychotic, antidepressant or antidopaminergic activity.

4,547,508
1-PHENYLISOQUINOLINE DERIVATIVES, PHARMACEUTICAL PRODUCTS CONTAINING THESE COMPOUNDS AND THEIR USE

Elmar Konz, and Hansjörg Kruse, both of Kelkheim, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

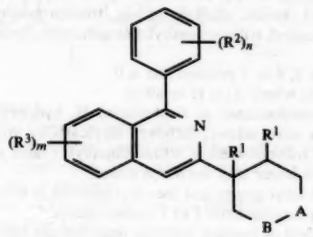
Filed Nov. 30, 1983, Ser. No. 556,684

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1982, 3244594

Int. Cl.[4] A61K *31/445;* C07D *401/04*

U.S. Cl. 514—307 3 Claims

1. A 1-phenylisoquinoline derivative of the formula I



I

in which m and n, independently of one another, denote one or two, one of A and B is CH_2 and other is a N-R^4 group, R^4 being hydrogen, benzyl or a straight-chain or branched, saturated or unsaturated C_1–C_6-alkyl radical, and the radicals R^1 denote hydrogen or, together, a bond, and R^2 denotes hydrogen, halogen, hydroxyl, nitro, amino, C_1–C_6-alkyl or C_1–C_6-alkoxy radicals, and R^3 denotes hydrogen, halogen, hydroxyl, nitro, amino, C_1–C_6-alkyl or C_1–C_6-alkoxy radicals, or the benzyloxy, methylenedioxy or ethylenedioxy group.

3. Method for treating depression by administering to the patient an effective amount of a 1-phenylisoquinoline derivative of the formula I in claim 1.

4,547,509
5,6,7-QUINOLINE CARBANILATES AND METHOD OF TREATING ISCHEMIC HEART DISEASE THEREWITH

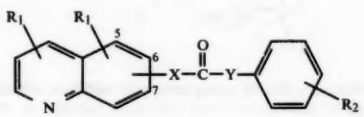
John H. Musser, Malvern, Pa., and Charles A. Sutherland, Hawthorne, N.Y., assignors to USV Pharmaceutical Corp., Tarrytown, N.Y.

Filed Jan. 3, 1983, Ser. No. 455,392

Int. Cl.[4] C07D *215/20;* A61K *31/47*

U.S. Cl. 514—311 15 Claims

1. A compound of the structure:



and pharmaceutically acceptable salts thereof wherein:

R_1 is H, alkyl, alkoxy, carboxyl, alkylcarboxy, lower alkyl carbonyl amido, dialkyl amino, trichloromethyl, tribromomethyl, trifluoromethyl, halogen, nitro, hydroxy or cyano:

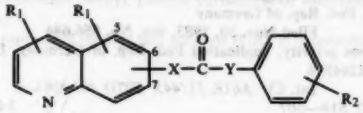
X is in the 5, 6 or 7 position and is O

Y is N-R_3 where R_3 is H or alkyl;

R_2 is H, monosubstituted or disubstituted hydroxy, alkyl, halogen, nitro, alkoxy, carboxyl, alkylcarboxy, trichloromethyl, tribromomethyl, trifluoromethyl, cyano, dialkylamino or lower alkyl carbonyl amido;

wherein said alkyl group and the alkyl moieties in alkoxy and alkylcarboxy contain from 1 to 7 carbon atoms.

5. A therapeutic composition for inhibiting lipolysis in a mammal which comprises, in combination with at least one pharmaceutically-acceptable extender, an effective amount for the inhibition of lipolysis of a compound of the formula:



and pharmaceutically acceptable salts thereof wherein:

R_1 is H, alkyl, alkoxy, carboxyl, alkylcarboxy, lower alkyl carbonyl amido, dialkyl amino, trichloromethyl, tribromomethyl, trifluoromethyl, halogen, nitro, hydroxy or cyano;

X is in the 5, 6 or 7 position and is 0,

Y is N—R_3 where R_3 is H or alkyl;

R_2 is monosubstituted or disubstituted H, hydroxy, alkyl, halogen, nitro, alkoxy, carboxyl, alkylcarboxy, trichloromethyl, tribromomethyl, trifluoromethyl, cyano, dialkylamino or lower alkyl carbonyl amido;

wherein said alkyl groups and the alkyl moieties in alkoxy and alkylcarboxy contain from 1 to 7 carbon atoms.

10. A method of treating ischemic heart disease and hypertriglyceridemia in a mammal by administering to said mammal an effective amount of a composition of claim 5.

4,547,510

8-BENZYLIDENE-5,6,7,8-TETRAHYDROQUINOLINE DERIVATIVES

Roger Crossley, Reading, England, assignor to John Wyeth & Brother Ltd., Maidenhead, England

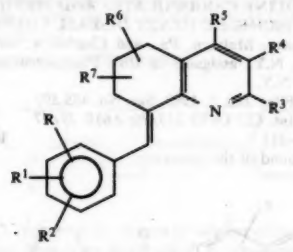
Filed Apr. 12, 1984, Ser. No. 599,388

Claims priority, application United Kingdom, Apr. 28, 1983, 8311652

Int. Cl.[4] A61K *31/47;* **C07D** *215/04*

U.S. Cl. 514—311 **17 Claims**

1. A compound of formula



(I)

or a pharmaceutically acceptable acid addition salt thereof, wherein

R represents lower alkoxy, alkanoyloxy of 2 to 7 carbon atoms or hydroxy;

R^1 and R^2 independently represent hydrogen, lower alkoxy, alkanoyloxy of 2 to 7 carbon atoms, hydroxy or lower alkyl;

R^3, R^4 and R^5 each represent hydrogen or lower alkyl with the proviso that at least one of R^3, R^4 and R^5 is the lower alkyl;

and R^6 and R^7 each represent hydrogen or lower alkyl, providing that when one of R^3, R^4 and R^5 represents a tertiary alkyl group, the other two are hydrogen.

17. A pharmaceutical composition comprising an amount effective for treating ulcers in a mammal in need thereof of a compound of formula I as claimed in claim 1 or a pharmaceutically acceptable acid addition salt thereof and a pharmaceutically acceptable carrier.

4,547,511

HETEROCYCLIC CARBOXAMIDES, COMPOSITIONS CONTAINING SUCH COMPOUNDS, PROCESSES FOR THEIR PREPARATION AND METHODS OF TREATMENT THEREWITH

Edgar Eriksoo, Helsingborg; Eva B. Sandberg, Löddeköpinge, and Lars J. T. Stalhandske, Helsingborg, all of Sweden, assignors to Aktiebolaget Leo, Helsingborg, Sweden

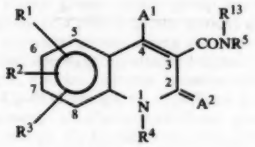
Filed Feb. 22, 1982, Ser. No. 350,890

Claims priority, application United Kingdom, Mar. 3, 1981, 8106594

Int. Cl.[4] C07D *215/22;* **A61K** *31/47*

U.S. Cl. 514—312 **8 Claims**

1. A method of treating a living animal body in order to enhance cell-mediated immunity comprising administering to said animal body a compound having the formula:

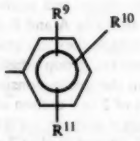


or a tautomer thereof, wherein the groups A^1 and A^2 are interchanged and there is a 2,3- rather than a 3,4-double bond;

where R^1, R^2 and R^3 are the same or different and selected from the group consisting of: hydrogen; lower alkyl; lower alkoxy; halogen; OH; $OCOR^8$; NR^6R^7; and NR^6COR^8; and where R^1 and R^2 or R^2 and R^3 together may also be in the form of a methylenedioxy group;

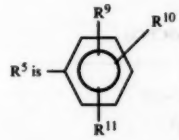
and where only one of R^1, R^2, and R^3 may be NO_2;

where R^4 is selected from the group consisting of: lower alkyl; lower alkenyl; cycloalkyl optionally mono- or disubstituted with a substituent selected from the group consisting of lower alkyl, lower alkoxy, OH and $OCOR^8$; and phenyl optionally mono- or disubstituted with a substituent selected from the group consisting of lower alkyl, lower alkoxy and halogen, and wherein R^5 is selected from the group consisting of a five- or six-membered heterocyclic ring containing at most two heteroatoms selected from the group consisting of S and N, and being optionally mono- or disubstituted with substituents selected from the group consisting of lower alkyl, lower alkoxy and halogen, and R^5 is further selected from the group:



wherein R^9, R^{10} and R^{11} are the same or different and selected from the group consisting of: hydrogen; lower alkyl; lower alkenyl; lower alkoxy; lower alkylthio; halogen; CN; SO_2CH_3; OH; $OCOR^8$; NR^6R^7; NR^6COR^8; $COOR^{12}$; OCH_2COOR^{12}; CH_2COOR^{12}; COR^8; and

wherein m is four or five;
and where R^9 and R^{10} or R^{10} and R^{11} together also may be in the form of a methylenedioxy group;
wherein A^1 is selected from the group consisting of OR^{12}, $OCOR^8$, NR^6R^7 and NR^6COR^8 and A^2 is selected from the group consisting of O and NR^6;
wherein R^6 and R^7 are selected from the group consisting of hydrogen and lower alkyl; wherein R^8 is lower alkyl; wherein R^{12} is selected from the group consisting of lower alkyl and M; and wherein M is selected from the group consisting of hydrogen and pharmaceutically-acceptable inorganic cations; and
wherein R^{13} is selected from the group consisting of hydrogen, lower alkyl optionally substituted with a substituent selected from the group consisting of OH, OR^8 and $OCOR^8$, and lower alkenyl; provided that R^{13} is selected from the group consisting of lower alkyl optionally substituted with a substituent selected from the group consisting of OH, OR^8 and $OCOR^8$, and lower alkenyl when



and R^9, R^{10} and R^{11} are selected from the group consisting or lower alkyl, lower alkenyl and lower alkoxy; and addition salts with pharmaceutically acceptable inorganic or organic acid;
the term "lower" when used herein meaning in each case that the group referred to may be straight or branched and contains 1 to 4 carbon atoms, inclusive, to said animal body in an amount effective for said purpose.

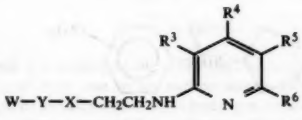
4,547,512

2-(IMIDAZOLYL ALKYLAMINO)-3-CARBOXY(OR HYDROXY)-PYRIDINES

Martin Jones, Stevenage, and Rodney C. Young, Bengeo, both of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

Division of Ser. No. 365,224, Apr. 5, 1982, Pat. No. 4,439,437. This application Nov. 25, 1983, Ser. No. 555,319
Claims priority, application United Kingdom, Apr. 28, 1981, 8112986
Int. Cl.[4] C07D *401/12*; A61K *31/455, 31/44*
U.S. Cl. 514—341 **8 Claims**

1. A compound of the formula (I):



(I)

or a pharmaceutically acceptable salt thereof where:
W is 4-imidazolyl or 4-imidazolyl substituted in the 5-position with methyl or bromine;
X is methylene or sulphur;
Y is methylene;
R^3 is carboxy or hydroxy;
R^4 is hydrogen or C_{1-4} alkyl;
R^5 is hydrogen, C_{1-4} alkyl or benzyl; and
R^6 is hydrogen or C_{1-4} alkyl.

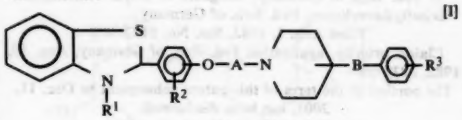
4,547,513

2-ARYLBENZOTHIAZOLINE DERIVATIVES AND THEIR USE IN TREATING ANGINA CORDIS

Jun-ichi Iwao, Takarazuka; Tadashi Iso, Sakai, and Masayuki Oya, Ibaraki, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

Filed Dec. 7, 1984, Ser. No. 679,466
Claims priority, application Japan, Dec. 27, 1983, 58-251934
Int. Cl.[4] C07D *417/02*
U.S. Cl. 514—321 **14 Claims**

1. A compound of the formula,



[I]

wherein
R^1 is formyl or lower alkanoyl;
R^2 is hydrogen, lower alkyl, lower alkoxy or nitro;
R^3 is hydrogen, lower alkyl, lower alkoxy or halogen; A is lower alkylene;
B is $—CO—(CH_2)_m—$ or —CH(OH)—;
m is 0 or 1; and
when m is 0, R^3 is not hydrogen, or a non-toxic acid addition salt thereof.

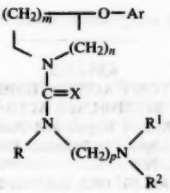
4,547,514

ARYLOXY-N-(AMINOALKYL)-1-PYRROLIDINE AND PIPERIDINE CARBOXAMIDES AND CARBOTHIOAMIDES HAVING ANTIARRHYTHMIC ACTIVITY

Pershottam P. Mathur, Midlothian, and William L. Smith, Richmond, both of Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Filed Dec. 5, 1983, Ser. No. 557,885
Int. Cl.[4] A61K *31/445, 31/535, 31/495, 31/385*
U.S. Cl. 514—327 **21 Claims**

1. A method for the treatment of cardiac arrhythmia in a patient consisting essentially of administering a cardiac arrhythmia inhibiting quantity of a compound of the formula:



wherein
Ar is selected from the group consisting of 1-naphthyl, 2-naphahyl, 2,3-dihydro-1H-inden-4-yl, 2,3-dihydro-1H-inden-5-yl, phenyl, substituted phenyl wherein the substituents are selected from lower alkyl of from 1 to 8 carbon atoms, lower alkyloxy of from 1 to 8 carbon atoms, halogen and trifluoromethyl;
m and n are 1 or 2 but are never 2 at the same time;
p is 1, 2, 3 or 4;
R is selected from hydrogen or lower alkyl of from 1 to 3 carbon atoms;
R^1 and R^2 are selected from hydrogen, lower alkyl of from 1 to 8 carbon atoms, phenyl, phenyl lower alkyl of from 7 to 9 carbon atoms, and cycloalkyl of from 3 to 8 carbon atoms, and R^1 and R^2 taken together with the adjacent atom may form a heterocyclic residue selected from 4-

morpholino, 1-pyrrolidino, 1-piperidino, 1-piperazino and 4-lower alkyl piperazin-1-yl;

X is oxygen or sulfur; and the pharmaceutically acceptable acid addition salts thereof.

4,547,515

AZOLYL-PHENOXY-TETRAHYDROFURAN-2-YLIDENE-METHANE FUNGICIDAL AGENTS

Hans-Ludwig Elbe, Wuppertal; Manfred Jautelat; Karl H. Büchel, both of Burscheid; Wilhelm Brandes, Leichlingen; Paul Reinecke, and Hans Scheinpflug, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 1, 1983, Ser. No. 518,870

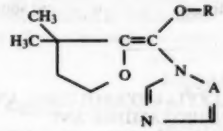
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1982, 3229734

The portion of the term of this patent subsequent to Dec. 11, 2001, has been disclaimed.

Int. Cl.[4] A01N *43/48, 43/50, 43/64*

U.S. Cl. 514—383 **10 Claims**

1. A process for combating plant pathogenic fungi comprising applying to such fungi, to a plant or to a place where a plant is to be grown, a fungicidally effective amount of an azolyl-phenoxy-tetrahydrofuran-2-ylidene-methane of the formula



in which

A is a nitrogen atom or the CH group, and

R is phenyl, or phenyl mono-, di- or tri-substituted by substituents independently selected from the group consisting of halogen, alkyl with 1 to 4 carbon atoms, alkoxy or alkylthio each with 1 or 2 carbon atoms, halogenoalkyl, halogenoalkoxy or halogenoalkylthio each with 1 or 2 carbon atoms and 1 to 5 halogen atoms, alkoxycarbonyl with 1 to 4 carbon atoms in the alkyl part, nitro, cyano, phenyl, phenoxy, and phenyl or phenoxy each substituted by at least one of halogen and alkyl with 1 or 2 carbon atoms,

or a physiologically acceptable acid addition salt thereof.

4,547,516

ANTISECRETORY AGENTS DERIVED FROM MELDRUM'S ACID

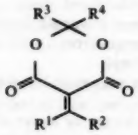
Francesco Bellini, Mount Royal, and Jehan Bagli, Kirkland, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 20, 1983, Ser. No. 543,713

Int. Cl.[4] A61K *31/38, 31/40;* **C07D** *233/54*

U.S. Cl. 514—385 **17 Claims**

1. A compound of formula I



(I)

wherein R^1 is hydrogen and R^2 is lower alkylthio, (2-thienylmethyl)thio or SCH_2— $COOR^5$ wherein R^5 is hydrogen or lower alkyl, or R^1 and R^2 are each independently lower alkylthio or (2-thienylmethyl)thio, or R^1 and R^2 together with the carbon atom to which they are attached form a 2-imidazolidinylidene; and R^3 and R^4 are each the same lower alkyl or R^3 and R^4 together with the carbon atom to which they are attached form a cyclohexane ring wherein said carbon atom is a spiro atom in common with the cyclohexane ring and the adjoining dioxane ring.

4,547,517

MICROBICIDAL N-SULPHENYLATED HYDANTOINS

Engelbert Kühle, Bergisch Gladbach; Wilfried Paulus; Hermann Genth, both of Krefeld; Paul Reinecke, Leverkusen, and Hans-Jürgen Rossienbroich, Monheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

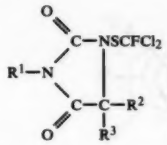
Filed Feb. 13, 1984, Ser. No. 579,844

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1983, 3305203

Int. Cl.[4] A61K *31/415;* **C07D** *233/82*

U.S. Cl. 514—390 **22 Claims**

1. An N-sulphenylated hydantoin of the formula



in which R^1 denotes an optionally substituted C_1–C_{12} alkyl, C_2–C_{12} alkenyl, C_5–C_{12} cycloalkyl, or an aralkyl radical having 6 to 10 carbon atoms in the aromatic part and 1 to 6 carbon atoms in the aliphatic part, substituents being selected from the group consisting of lower alkyl and halogen, and R^2 and R^3 are identical or different and denote hydrogen, C_1–C_{12} alkyl, C_2–C_{12} alkenyl or are linked to form a C_5–C_{12} cycloalkyl radical.

14. A process for protecting a substance against microbial attack which comprises applying to said substance a microbicidally effective amount of an N-sulphenylated hydantoin of claim 1.

4,547,518

ANTIEMETIC N-(1-SUBSTITUTED-4,5-DIHYDRO-1H-PYRAZOL-4-YL)BENZAMIDES

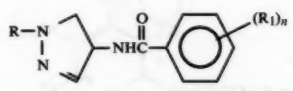
Lennox B. Turnbull; John A. Donohue, and Gunnar E. Jagdmann, Jr., all of Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

Filed Apr. 6, 1984, Ser. No. 597,421

Int. Cl.[4] A61K *31/415;* **C07D** *231/06*

U.S. Cl. 514—403 **10 Claims**

1. A compound selected from the group consisting of N-(1-substituted-4,5-dihydro-1H-pyrazol-4-yl)benzamides having the formula:



wherein;

R is selected from loweralkyl, cycloalkyl or phenylloweralkyl;

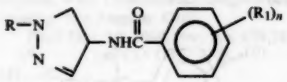
R_1 is selected from hydroxy, cyano, nitro, amino, methylamino, dimethylamino, halo, trifluoromethyl, loweralkyl, loweralkoxy, sulfamoyl, or acetamido;

n is an integer from 1 to 3 inclusive, and

R_1 can be the same radical or different radicals.

5. A method for treating warm blooded animals for emesis which comprises internally administering thereto an emesis-

inhibiting effective amount of a compound selected from the group consisting of N-(1-substituted-4,5-dihydro-1H-pyrazol-4-yl)benzamides having the formula:



wherein:

R is selected from loweralkyl, cycloalkyl or phenylloweralkyl;

R_1 is selected from hydroxy, cyano, nitro, amino, methylamino, dimethylamino, halo, trifluoromethyl, loweralkyl, loweralkoxy, sulfamoyl or acetamido,

n is an integer from 1 to 3 inclusive, and

R_1 can be the same or different.

4,547,519

TETRAHYDRO-3,5-DIOXO-1H-PYRROLIZINE-7A(5H)-CARBOXYLIC ACID AND BENZYL ESTERS AND AMIDES THEREOF AND THEIR USE IN REVERSING AMNESIA

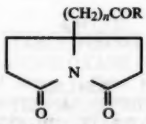
Donald E. Butler, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 381,486, May 24, 1982, abandoned. This application Feb. 9, 1983, Ser. No. 464,193

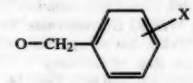
Int. Cl.[4] A61K *31/40;* **C07D** *487/06*

U.S. Cl. 514—413 **10 Claims**

1. A compound having the structural formula



wherein n is zero to three and R is



wherein X is hydrogen, alkyl of from one to six carbon atoms, alkoxy of from one to six carbon atoms, halo, or trifluoromethyl; or NR_1R_2 where R_2 is hydrogen or alkyl of from one to six carbon atoms and R_1 is hydrogen, alkyl of from one to six carbon atoms, or alkyl of from two to six carbon atoms substituted by amino, alkylamino, or dialkylamino in which alkyl contains one to six carbon atoms.

10. A method for reversing amnesia caused by electroconvulsive shock in humans which comprises administering to said human an effective amount of tetrahydro-3,5-dioxo-1H-pyrrolizine-7a(5H)-propanoic acid; tetrahydro-3,5-dioxo-1H-pyrrolizine-7a(5H)-propanoic acid, ethyl ester; or tetrahydro-3,5-dioxo-1H-pyrrolizine-7a(5H)-propanoic acid, benzyl ester.

4,547,520

5-OXIME DERIVATIVES OF MILBEMYCINS AND VETERINARY AND AGRICULTURAL USE THEREOF

Junya Ide; Shigeki Muramatsu; Yasuo Nakada, and Noritoshi Kitano, all of Hiromachi, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

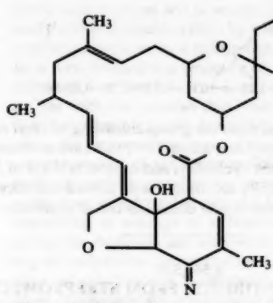
Filed Nov. 25, 1983, Ser. No. 555,185

Claims priority, application Japan, Nov. 25, 1982, 57-206462

Int. Cl.[4] A61K *31/365;* **C07D** *493/22*

U.S. Cl. 514—450 **40 Claims**

1. A compound of the formula (II):



(II)

in which R^1 represents methyl, ethyl or isopropyl and R^2 represents hydrogen, a C_1–C_6 alkyl group, benzyl, benzyl substituted with one C_1–C_6 alkyl, halogen or nitro or a group of formula $—CH_2COOR^3$, in which R^3 represents hydrogen or a C_1–C_6 alkyl group; and,

when R^2 represents hydrogen, a veterinary or an agriculturally acceptable salt or ester thereof.

4,547,521

16-METHOXY-16-METHYL PROSTAGLANDIN E_1 DERIVATIVES, A PROCESS FOR PREPARING THEM AND THEIR USE AS GASTROPROTECTIVE AGENTS

Umberto Guzzi, Milan, and Romeo Ciabatti, Novate Milanese, both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 135,561, Mar. 31, 1980, abandoned. This application Nov. 18, 1983, Ser. No. 553,470

Claims priority, application Italy, Apr. 10, 1979, 21707 A/79

Int. Cl.[4] C07C *177/00;* **A61K** *31/557*

U.S. Cl. 514—530 **5 Claims**

2. The stereoisomer of the 11α-15-dihydroxy-16-methoxy-16-methyl-9-oxo-prosta-13-(E)-ene-1-oic acid methyl ester having a chirality at C_{16} corresponding to that at C_3 of the stereoisomer of 3-methoxy-3-methyl-2-oxo-hepthyl-phosphonic acid dimethyl ester which as an $[\alpha]_D^{20}$ of +41.2°, (c=1%, $CHCl_3$), and having a chirality at C_{15} corresponding to that of the more polar stereoisomer of 9-acetoxy-15-hydroxy-16-methoxy-16-methyl-11α-[(tetrahydro-1H-pyran-2-yl)oxy]prosta-13(E)-ene-1-oic acid methyl ester, which is the second eluted product in a chromatographic separation of stereoisomers on silica gel using sequentially a mixture petroleum ether/ethyl ether 8:2, (v/v), and then petroleum ether-/ethyl ether 6:4, (v/v).

4,547,522

CYCLOPROPANE CARBOXYLIC ACID DERIVATIVES

Jacques Martel, Bondy; Jean Tessier, Vincennes, and André Teche, Paris, all of France, assignors to Roussel Uclaf, Paris, France

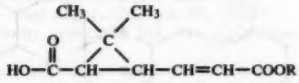
Division of Ser. No. 254,537, Apr. 15, 1981, Pat. No. 4,402,972. This application Jun. 14, 1983, Ser. No. 504,230

Claims priority, application France, Apr. 16, 1980, 80 08491; Sep. 24, 1980, 80 20478

Int. Cl.[4] A01N *53/00*; C07C *69/74*

U.S. Cl. 514—531 7 Claims

1. A compound having the formula



wherein R is selected from the group consisting of alkyl of 1 to 8 carbon atoms, alkenyl and alkynyl of 2 to 8 carbon atoms and optionally unsaturated cycloalkyl and cycloalkylalkyl of 3 to 8 carbon atoms optionally substituted with at least one alkyl and the double bond in the 3-side chain has the Z geometry.

4,547,523

POLYETHER ANTIBIOTIC FROM STREPTOMYCES

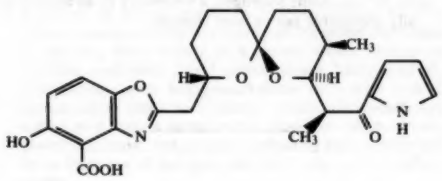
Walter D. Celmer, New London; Walter P. Cullen, East Lyme, both of Conn.; Hiroshi Maeda, and Junsuke Tone, both of Chita, Japan, assignors to Pfizer Inc., New York, N.Y.

Filed Nov. 7, 1983, Ser. No. 549,378

Int. Cl.[4] C07D *263/56*

U.S. Cl. 514—375 5 Claims

1. The antibiotic of the formula



and the pharmaceutically-acceptable base salts thereof.

4,547,524

INSECTICIDAL BENZOYL HYDRAZONE DERIVATIVES

Kimiyoshi Kaneko, Isehara; Hiromichi Ishikawa, Atsugi; Satoru Moriyama, Hatano, and Tsugio Uchiyama, Atsugi, all of Japan, assignors to Hokko Chemical Industry Co., Ltd., Japan

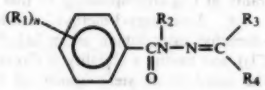
Filed Feb. 14, 1983, Ser. No. 466,101

Claims priority, application Japan, Aug. 14, 1981, 56-126590

Int. Cl.[4] C07C *109/10, 127/22*; A01N *47/28, 37/18*

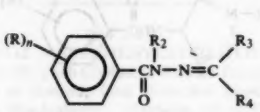
U.S. Cl. 514—594 2 Claims

1. A benzoyl hydrazone derivative of the general formula



wherein R_1 is a lower alkyl group, a lower alkoxy group, a halogen atom or trifluoromethyl; n is 1 or 2; R_2 is a lower alkyl group, an alkylcarbonyl group, a halogenated lower alkylcarbonyl group, a benzoyl group, a lower alkoxycarbonyl group or a lower alkylcarbamoyl group; and R_3 and R_4 individually represent hydrogen atom, a lower alkyl group or a phenyl group, or R_3 and R_4 together can form a cyclohexane ring.

2. An insecticide composition which comprises as an active ingredient an effective insecticidal amount of a benzoyl hydrazone derivative of the formula



wherein R_1 is a lower alkyl group, a lower alkoxy group, a halogen atom or trifluoromethyl; n is 1 or 2; R_2 is a lower alkyl group, an alkylcarbonyl group, a halogenated lower alkylcarbonyl group, a benzoyl group, a lower alkoxycarbonyl group or a lower alkylcarbamoyl group; and R_3 and R_4 individually represent hydrogen atom, a lower alkyl group or a phenyl group, or R_3 and R_4 together can form a cyclohexane ring, in a suitable carrier.

4,547,525

REDUCING METHANE PRODUCTION IN FISCHER-TROPSCH REACTIONS

Chang J. Kim, Short Hills, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 19, 1983, Ser. No. 563,109

Int. Cl.[4] C07C *1/04*

U.S. Cl. 518—713 18 Claims

1. A process for reducing methane formation in a Fischer-Tropsch process for synthesizing hydrocarbons which comprises contacting, at an elevated temperature of 100°–500° C. and a pressure of from about 100–10,000 kPa. a H_2/CO feed mixture with a heterogeneous catalyst comprising one or more Group VIII metals supported on an inorganic refractory oxide support for a time sufficient to produce hydrocarbons, including methane, wherein one or more olefins is added to the H_2/CO feed mixture in an amount sufficient to reduce said methane formation to a level lower than it would be without adding said olefin to said feed.

4,547,526

FLAME PROTECTION COMPOSITION COMPRISING ALUMINUM TRIHYDRATE, ORGANIC BINDER, AND A SULFUR COMPOUND AND A POLYURETHANE FOAM PROVIDED WITH SUCH FLAME-PROTECTION COMPOSITION

Manhal Al-Tabaqchali, Kurt-Lindemannstr. 25, D-6903 Neckargemünd; Ludwig Wesch, Görresstrasse 54, D-6900 Heidelberg, and Edgar Weiss, Am Stangenberg 37, D-6901 Neckarsteinach, all of Fed. Rep. of Germany

Continuation of Ser. No. 330,695, Dec. 14, 1981, Pat. No. 4,455,396. This application May 18, 1984, Ser. No. 611,714

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1980, 3047823

The portion of the term of this patent subsequent to Jun. 19, 2001, has been disclaimed.

Int. Cl.[4] C08L *33/08*

U.S. Cl. 521—54 21 Claims

1. Flame protection compositions for the complete impregnation of inflammable articles, comprising from 30% up to about 50% by weight of the total composition of aluminum trihydrate bound in an organic binder and a sulfur compound having at least one sulfo group and/or sulfonium ions in a proportion of between 7.5 and 30% by weight based upon the weight of the total composition.

4,547,527
IMPREGNATION SUSPENSION SYSTEM FOR EXPANDABLE STYRENE/MALEIC ANHYDRIDE PARTICLES

Alvin R. Ingram, West Chester, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 10, 1984, Ser. No. 679,785
Int. Cl.[4] C08J 9/18
U.S. Cl. 521—60 **5 Claims**

1. A process for preparing expandable particles from non-equimolar copolymers of styrene and a minor amount of maleic anhydride comprising:

a. forming an aqueous suspension of particles of a non-equimolar copolymer of styrene and a minor amount of maleic anhydride, said suspension being stabilized by a suitable suspending agent system;

b. adding to the suspension a mixture of 3 to 12% by weight based on copolymer of a hydrocarbon blowing agent and 3–20% by weight based on water of a water-soluble metal salt;

c. maintaining said suspension at a temperature of between 80° C. and 150° C. until said hydrocarbon is incorporated into the copolymer particle; and

d. separating said particles from said aqueous suspension.

4,547,528
METHOD OF PREVENTING SCORCH IN A POLYURETHANE FOAM AND PRODUCT THEREOF

Barry A. Jacobs, Bethel, and Michael J. Reale, Fairfield, both of Conn., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 24, 1984, Ser. No. 686,315
Int. Cl.[4] C08G 18/14, 18/30, 18/32
U.S. Cl. 521—121 **16 Claims**

1. A method for stabilizing a flame retarded polyurethane foam composition against scorching which comprises incorporating in said composition of an effective amount of a mixture of an N-alkanoyl-N,N′-dialkyl-phenylenediamine compound and a fluorescent brightener for scorch inhibition.

9. A flame retarded polyurethane foam composition stabilized against scorching which contains an amount of a mixture of an N-alkanoyl-N,N′-dialkylphenylenediamine compound and a fluorescent brightener effective for scorch inhibition.

4,547,529
STORAGE STABLE, FOAMABLE TWO-PART POLYORGANOSILOXANE COMPOSITIONS

Chi-Long Lee, and James A. Rabe, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 25, 1985, Ser. No. 715,604
Int. Cl.[4] C08J 9/14
U.S. Cl. 521—122 **21 Claims**

1. A two-part polyorganosiloxane composition which when combined to form a homogeneous, flowable mixture yields a cured foam under atmospheric pressure and at a temperature above the boiling point of the blowing agent contained therein, said composition comprising

(A) a hydroxyl endblocked polydimethylsiloxane exhibiting a viscosity of from 0.1 to 100 Pa.s at 25° C.;

(B) a liquid alkyl orthosilicate or partial hydrolyzate thereof in an amount sufficient to cure said polydimethylsiloxane with the proviso that ingredients (A) and (B) are maintained in separate parts of said composition;

(C) an amount of a compatible tin compound sufficient to catalyze the reaction of (A) and (B);

(D) a blowing agent maintained under superatmospheric pressure and having a boiling point of no higher than 25° C. under atmospheric pressure, the amount of (D) being sufficient to convert said homogeneous flowable mixture to a foam under atmospheric pressure; and

(E) a foam stabilizer in an amount sufficient to stabilize said foam during the curing process, where (E) consists essentially of a resinous, benzene-soluble organosiloxane copolymer consisting essentially of $SiO_{4/2}$ units, silicon-bonded hydroxyl groups, $(CH_3)_3SiO_{\frac{1}{2}}$ units and fluorine-containing units selected from the group consisting of $R_aR'_bSiO_{(4-a-b)/2}$, $R''[Si(R')_bO_{(3-b)/2}]_2$ and mixtures thereof, where R is a monovalent organic radical containing at least four perfluorinated carbon atoms and is bonded to the silicon atom of said fluorine-containing units by a sequence of at least two methylene units or by a silicon-bonded oxygen atom that is, in turn, bonded to a sequence of at least two methylene units, R′ is an alkyl radical containing from 1 to 3 carbon atoms, R″ is an divalent organic radical containing at least four perfluorinated carbon atoms and is bonded to the silicon atoms of said fluorine-containing units by a sequence of at least two methylene units or by a silicon-bonded oxygen atom that is, in turn, bonded to a sequence of at least two methylene units, a is 1 or 2, b is 0, 1 or 2, and the sum of a and b is 3 or less with the proviso that when R and R″ represent fluorine-containing units bonded to silicon via an oxygen atom the orgnosiloxane copolymer optionally contains repeating units of the formula $GSiO_{3/2}$ where G represents the residue obtained by removal of the hydrogen atom from a hydroxyl group of a linear organic polymer containing an average of at least one terminal hydroxyl group per molecule and selected from the group consisting of polyethers, polyoxyalkylene glycols, homopolymers of ethylenically unsaturated alcohols and copolymers of ethylenically unsaturated alcohols with ethylenically unsaturated hydrocarbons; the molar ratio of all units other than $SiO_{4/2}$ and hydroxyl groups to $SiO_{4/2}$ units is from 0.7:1 to 1.1:1, inclusive, and the concentration of said fluorine-containing units and any $GSiO_{3/2}$ units is sufficient to (a) impart a surface tension of less than 2.2×10^{-4} newtons per centimeter at 25° C. to a 10 percent by weight solution of (E) in a trimethylsiloxy endblocked polydimethylsiloxane exhibiting a viscosity of 0.01 Pa.s at 25° C. and (b) require the addition of from 0 to 100 percent by weight of xylene to said 10 percent by weight solution to achieve optical clarity at 25° C.

4,547,530
MISCIBLE POLYMER BLENDS CONTAINING POLY(2-ALKYL-2-OXAZOLINE)

Kathleen M. McCreedy; James C. Pawloski, both of Midland, Mich.; Henno Keskkula, Austin, Tex., and Edward H. Yonkers, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 15, 1983, Ser. No. 552,211
Int. Cl.[4] C03L 9/02
U.S. Cl. 521—139 **6 Claims**

1. A semipermeable membrane comprising a blend or alloy of a first polymer which is a polymer of a 2-oxazoline and at least one other polymer which is not a polymer of a 2-oxazoline which other polymer is miscible with the first polymer at the relative proportions contained in the membrane, wherein the weight ratio of the first polymer and the other polymer is from about 19:1 to 1:19.

4,547,531
TWO COMPONENT (PASTE-PASTE) SELF-CURING DENTAL RESTORATIVE MATERIAL

Samuel Waknine, Wallingford, Conn., assignor to Pentron Corporation, Wallingford, Conn.

Filed Aug. 2, 1984, Ser. No. 636,970
The portion of the term of this patent subsequent to Oct. 1, 2002, has been disclaimed.
Int. Cl.[4] C08K 3/22, 3/34, 3/36
U.S. Cl. 523—116 **26 Claims**

1. A chemically curable dental restorative material comprising a two-component paste-paste system wherein:

(i) a first initiator-containing paste system comprises from about 15 to 40% by weight of a polymerizable meth-

acrylic ester monomeric system comprising a cross-linking methacrylate monomer, at least one co-monomeric methacrylate diluent and a free radical-generating catalyst, and from about 60 to 85% by weight of an inorganic filler prepared by wet milling, surface etching milling, and a silanizing milling; and

(ii) a second accelerator-containing paste system comprises from about 15 to 31% by weight of a polymerizable methacrylic ester monomeric system comprising a cross-linking methacrylate monomer, at least one co-monomeric methacrylate diluent and an inorganic amine accelerator and from 69 to 85% by weight of an inorganic filler prepared by wet milling, surface etching milling, and a silanizing milling;

said first and second paste systems being admixed in substantially equal proportions to form the chemically curable dental restorative material.

4,547,532

ANTIFOULING PAINT

John R. Bednarski, Flushing, N.Y.; Melvin H. Gitlitz, and David A. Russo, both of Edison, N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

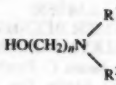
PCT No. PCT/US83/00516, § 371 Date Oct. 5, 1983, § 102(e) Date Oct. 5, 1983, PCT Pub. No. WO83/03423, PCT Pub. Date Oct. 13, 1983

Continuation-in-part of Ser. No. 365,062, Apr. 2, 1982, abandoned. This PCT application Apr. 1, 1983, Ser. No. 563,420

Int. Cl.⁴ C08L *33/02*

U.S. Cl. 523—122 **4 Claims**

1. In an antifouling paint composition comprising (1) a solubilized polymer derived at least in part from at least one triorganotin derivative of an ethylenically unsaturated acid and a pigment comprising cuprous oxide, zinc oxide or a mixture of cuprous and zinc oxides; the improvement comprising a viscosity stabilizer consisting of at least one of (a) a mixture of an organotin compound comprising a bis(tri-lower alkyltin)oxide and a nitrogen compound of the general, formula



where R^1 and R^2 are lower alkyl and n is 0 or an integer from 1–4 or (b) the reaction product of said organotin compound and said nitrogen compound; wherein the weight ratio of organotin compound to nitrogen compound is from 1:1 to 10:1.

4,547,533

GLASS-FIBER-REINFORCED ABS-MOLDING COMPOSITIONS

Karl Zabrocki, Buettgen; Christoph Tiburtius, Cologne; Joachim Döring, Cologne, and Klaus Richter, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Fed. Rep. of Germany

Filed Jun. 27, 1984, Ser. No. 625,036

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1983, 3324909

Int. Cl.⁴ C08K *7/14, 9/04;* **C08L** *55/02;* **C03C** *25/02*

U.S. Cl. 523—206 **9 Claims**

1. A glass-fiber-reinforced ABS-molding composition comprising:

(a) from 60 to 98% by weight of an ABS-plastic;

(b) from 2 to 40% by weight of sized glass fibers; and

(c) from 0 to 5% by weight of one or more additives,

wherein the glass fiber is treated with a size comprising a polymer containing epoxy groups and a copolymer of (i) acrylonitrile and (ii) styrene, nuclear-methylated, α-methyl styrene, methyl methacrylate or a mixture thereof.

4,547,534

METHOD TO DISPERSE FINE SOLIDS WITHOUT SIZE REDUCTION

Leo di Ricco, San Jose; Edward Schnee, Byron; Zorro Stefanini, San Jose, and Duncan W. Frew, Alamo, all of Calif., assignors to Memorex Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 477,428, Mar. 18, 1983, abandoned, which is a continuation of Ser. No. 307,320, Sep. 30, 1981, abandoned. This application Aug. 3, 1984, Ser. No. 637,390

Int. Cl.⁴ C08J *3/20*

U.S. Cl. 523—324 **9 Claims**

1. A method of producing an abrasive resistant magnetic coating comprising dispersing magnetic particles and abrasive resistant hard particles in a slurry containing a resin binder matrix and surfactant by using mill means having a plurality of non-metallic discs and containing a zirconium oxide milling media.

4,547,535

AQUEOUS COATING COMPOSITION COMPRISING SELF-EMULSIFIABLE ESTER OF EPOXY AND ACID CONTAINING ADDITION POLYMER

George L. Brown, Scotch Plains, and Arthur T. Spencer, New Providence, both of N.J., assignors to SCM Corporation, New York, N.Y.

Continuation of Ser. No. 249,795, Apr. 1, 1981, Pat. No. 4,442,246, which is a continuation of Ser. No. 95,682, Nov. 19, 1979, abandoned, which is a continuation-in-part of Ser. No. 914,472, Jun. 12, 1978, abandoned. This application Sep. 30, 1982, Ser. No. 430,158

The portion of the term of this patent subsequent to Apr. 10, 2001, has been disclaimed.

Int. Cl.⁴ C08L *63/02*

U.S. Cl. 523—404 **9 Claims**

1. A composition suitable for sanitary can coatings consisting essentially of a self-emulsified mixture substantially free of oxirane groups including a hydroxy ester copolymer containing carboxyl groups at least some of which, sufficient to achieve self-emulsification in water, are neutralized by volatile amine; which composition is the product of the reaction of:

(a) an acidic addition copolymer having an acid number greater than 150 comprising a copolymer of monoethylenically unsaturated monomers selected from the group consisting of thyrene, vinyl toluene, acrylic acid esters, methacrylic acid esters, acrylic acid and methacrylic, acid containing at least about 30% by weight of acrylic or methacrylic acid based on the total weight of monomers; and

(b) a mixture containing (bisphenol-A)-epichlorohydrin polyether epoxy resin including at least 5% by weight of polyether epoxy resin containing oxirane groups and at least 25% by weight of said (bisphenol-A)polyether being terminated with bisphenol-A and devoid of oxirane groups, said mixture comprising at least 40% of the total resin solids and containing sufficient oxirane groups to provide a ratio of oxirane groups to carboxyl groups of 1:2 to 1:20;

conducted in the presence of a tertiary amine in amounts from 0.1% to 0.3% by weight of reactants subject to esterification;

said composition having at least a portion of the carboxyl groups in said hydroxy ester copolymer reacted with base to render the composition self-emulsifiable in water, and said composition emulsified in water in the substantial absence of added emulsifying agents.

4,547,536

POLYESTER BLENDS CONTAINING A METAL OXIDE DESICCANT

Lester G. Nabors, Akron, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 296,089, Aug. 26, 1981, Pat. No. 4,485,204. This application Jul. 30, 1984, Ser. No. 636,053
Int. Cl.[4] C08K 3/20; C08L 67/00
U.S. Cl. 523—514 14 Claims

1. A composition consisting essentially of about 50 to 90 weight percent of at least one polyalkylene terephthalate polyester resin, about 3 to 20 weight percent of at least one desiccant, and about 3 to 20 weight percent of at least one normally solid poly(1-alkene); and optionally further about 0.5 to 5 weight percent of a light mineral oil;

wherein said desiccant is at least one of the group consisting of calcium oxide, magnesium oxide, strontium oxide, barium oxide, aluminum oxide.

4,547,537

N-PIPERIDYL TETRAHYDRO-1,4-OXAZIN-2-ONE LIGHT STABILIZERS

Roger F. Malherbe, Basel, Switzerland, and Michael H. Ackerman, East Meadow, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

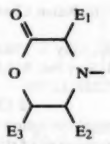
Filed Aug. 2, 1984, Ser. No. 637,240
Int. Cl.[4] C08K 5/34; C07D 413/00, 29/30
U.S. Cl. 524—97 19 Claims

1. A light stabilizer compound of the formula I

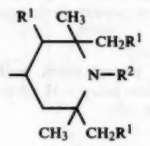
L—T

wherein

L is a tetrahydro-1,4-oxazin-2-one group of the formula



E_1 is hydrogen, alkyl of 1 to 16 carbon atoms or phenyl,
E_2 is hydrogen, alkyl of 1 to 4 carbon atoms or phenyl,
E_3 is hydrogen or methyl,
T is a group of the formula



with L attached to the 4-position of the piperidinyl ring,
R^1 is hydrogen or alkyl of 1 to 5 carbon atoms, and
R^2 is hydrogen, oxygen, hydroxyl, alkyl of 1 to 12 carbon atoms, alkenyl with 3 to 8 carbon atoms, propargyl, benzyl, cyano, hydroxyalkyl of 2 to 4 carbon atoms, alkanoyl of 2 to 10 carbon atoms, alkenoyl of 3 to 4 carbon atoms, benzoyl, alkoxy of 1 to 8 carbon atoms, alkanoyloxy of 2 to 10 carbon atoms, alkenoyloxy of 3 to 4 carbon atoms or benzoyloxy.

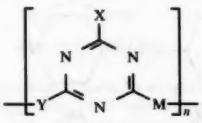
4,547,538

ALKYLATED POLYALKYLENEPOLYAMINES, SUBSTITUTED OXO-PIPERAZINYL-TRIAZINES AND UV LIGHT STABILIZED COMPOSITIONS

John T. Lai, Broadview Heights, and Pyong N. Son, Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 350,536, Feb. 2, 1982, Pat. No. 4,480,092. This application Oct. 26, 1984, Ser. No. 664,901
Int. Cl.[4] C08K 5/34
U.S. Cl. 524—100 11 Claims

1. A composition of matter resistant to degradation by ultraviolet light comprising an organic material subject to ultraviolet light degradation having dispersed therein from about 0.01 part to about 5 parts by weight of a stabilizer compound consisting of a polysubstituted piperazinone distally linked to a triazine nucleus, per 100 parts of said organic material, said stabilizer compound being represented by the structural formula

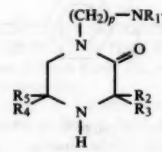


(I)

wherein,

n is an integer in the range from 1 to about 10, said compound having functional end groups selected from H, OH and Cl when n is greater than 1;

X is a substituent having the following formula (II):



(II)

wherein,

R_1 represents alkyl having from 1 to about 24 carbon atoms, cycloalkyl having from 5 to about 7 carbon atoms, aralkyl having from 7 to about 20 carbon atoms, azaalkyl having from 1 to about 24 carbon atoms, and azacycloalkyl having from 6 to about 20 carbon atoms;

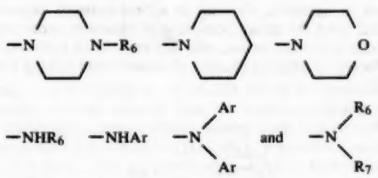
R_2, R_3, R_4 and R_5 independently represent alkyl having from 1 to about 24 carbon atoms;

p represents an integer in the range from 2 to about 10;

Y may be the same as X or M;

M may be Z or Z', wherein

Z represents a radical selected from the group consisting of Cl,

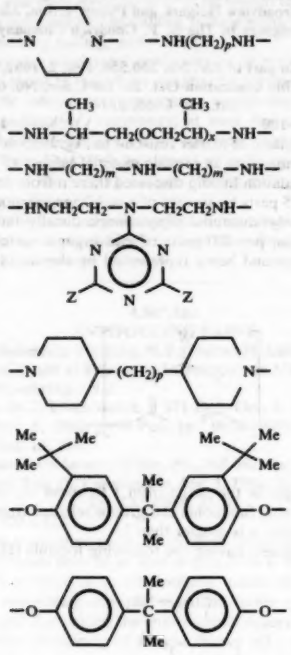


Ar = aryl, aralkyl, phenyl

R_6, R_7 represent alkyl having from 2 to about 24 carbon atoms;

Ar represents aryl;

Z' represents a radical selected from the group consisting of



Me = methyl

x represents an integer in the range from 1 to about 50; and, when n=1, Y and M may be the same as X, and,

Z and Z' each includes a terminal functional group selected from H, lower alkyl having from 1 to about 5 carbon atoms, and hydroxyalkyl having from 1 to about 5 carbon atoms.

4,547,539

SUBSTITUTED (4-HYDROXYPHENYLTHIO) SUCCINIC ANHYDRIDE OR SUCCINATE STABILIZERS

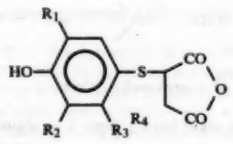
John D. Spivack, and Stephen D. Pastor, both of Spring Valley, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 463,176, Feb. 3, 1983, Pat. No. 4,497,959. This application Nov. 1, 1984, Ser. No. 667,190

Int. Cl.[4] C08K *5/36*

U.S. Cl. 524—112 **8 Claims**

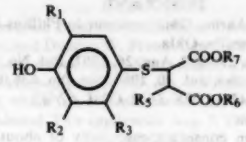
1. A composition of matter comprising an organic material subject to oxidative, thermal or actinic-induced degradation selected from the group consisting of naturally occurring and synthetic polymers, resins, oils, fats and waxes stabilized with an effective stabilizing amount of a compound having formula I or II



(I)

or

-continued



(II)

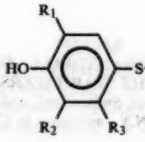
wherein

R_1 and R_2 are independently alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl or phenyl substituted by alkyl of 1 to 12 carbon atoms, aralkyl of 7 to 9 carbon atoms or said aralkyl substituted by alkyl of 1 to 12 carbon atoms; R_2 may also represent hydrogen;

R_3 is hydrogen or methyl;

R_4 is hydrogen, alkyl of 1 to 6 carbon atoms or phenyl;

R_5 is hydrogen, alkyl of 1 to 6 carbon atoms, alkylthio of 1 to 18 carbon atoms, phenylthio, or group of the structure



where R_1, R_2 and R_3 are defined above; and

R_6 and R_7 are independently hydrogen, alkyl of 1 to 30 carbon atoms, alkyl of 2 to 4 carbon atoms substituted by alkenoyloxy of 3 to 4 carbon atoms, phenyl or phenyl substituted by alkyl of 1 to 12 carbon atoms.

4,547,540

CORROSION PROTECTION IN COOLING WATER SYSTEMS

Alan M. Yeoman, Naperville, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 374,550, May 3, 1982, abandoned. This application Jul. 18, 1983, Ser. No. 514,422

Int. Cl.[4] C08K *5/16;* **C09K** *3/00;* **C23F** *11/00*

U.S. Cl. 524—130 **3 Claims**

1. A composition for inhibiting ferrous metal corrosion in an aqueous system consisting essentially of a copolymer of styrene sulfonic acid and maleic anhydride or maleic acid and water-soluble salts of said copolymer; and a blend of two phosphonates consisting of (1) 2-phosphonobutane-1,2,4-tricarboxylic acid and (2) one member of the group consisting of (a) aminotrimethylene phosphonic acid, and (b) hydroxyethylidene 1,1-diphosphonic acid, with the copolymer being combined with the blend of phosphonates so as to provide in the aqueous system to be treated:

I. 7.5–15 ppm of the copolymers, and

II. 9.5–10.4 ppm of the blend of phosphonates, with the dosage of the blend of phosphonates being 6–12 ppm of (1) and 3.5–8.4 ppm of either 2(a) or 2(b).

4,547,541

MELT FED BLENDING PROCESS

Joseph C. Golba, Jr., Ballston Spa, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 1, 1983, Ser. No. 528,383

Int. Cl.[4] C08K *5/51*

U.S. Cl. 524—151 **14 Claims**

1. A process for producing thermoplastic polymer blends comprising:

a. separately melting two or more compositions, each con-

taining a major portion of one of said thermoplastic polymers to form a uniform melt thereof; and

b. subsequently blending the resulting melts to form a uniform admixture of melts under conditions where the viscosity and elasticity values of the compositions are in a ratio within the range of about 1:1 to about 1:3 during initial blending of the admixture of the melts.

4,547,542

SULFONATED POLYMER AND COMPOSITIONS THEREOF

Robert D. Lundberg, Bridgewater, and Warren A. Thaler, Flemington, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.Y.

Continuation-in-part of Ser. No. 426,666, Sep. 29, 1982, Pat. No. 4,446,267, which is a division of Ser. No. 332,850, Dec. 21, 1981, Pat. No. 4,421,898. This application Dec. 23, 1983, Ser. No. 564,719

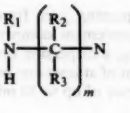
The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.

Int. Cl.[4] C08K *5/09, 5/21;* **C08L** *51/08, 81/08*

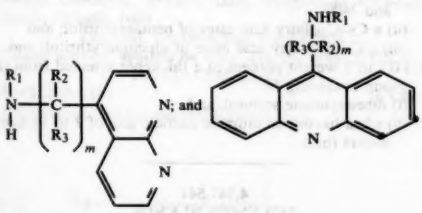
U.S. Cl. 324—211 **13 Claims**

1. A sulfonated polymer which has about 10 to about 200 meq. of sulfonate groups per 100 grams of said sulfonated polymer, said sulfonate groups being neutralized with a polycaprolactone polymer, said polycaprolactrone polymer having an $\overline{Mn}$ measured by GPC of about 200 to 50,000, said polycaprolactone polymer having the formula selected from the groups consisting of a polycaprolactone formed by the reaction of an ϵ-caprolactone with an amine compound having the formula selected from the group consisting of:

$(CH_2)_x$;



$(CH_2)_{x-1}$;



wherein R_1, R_2, and R_3 are selected from the group consisting of hydrogen, alkyl groups having about 1 to about 10 carbon atoms and aryl groups having about 1 to about 10 carbon atoms, x is an integer of from 4 to 7 and m is an integer of from 0 to 20 said sulfonated polymer being formed from a polymer selected from the group consisting of EPDM terpolymer, Butyl rubber, polystyrene, poly-t-butyl styrene, polychlorostyrene and polymethyl styrene.

4,547,543

WATER-ABSORPTIVE CONTACT LENSES

Takanori Shibata; Masashige Yamanaka, and Hiroyuki Kako, all of Nagoya, Japan, assignors to Toyo Contact Lens Co., Ltd., Nagoya, Japan

Filed Nov. 8, 1984, Ser. No. 669,374

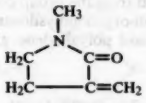
Claims priority, application Japan, Dec. 27, 1983, 58-252028; Jul. 26, 1984, 59-156093

Int. Cl.[4] C08F *26/02*

U.S. Cl. 524—264 **7 Claims**

1. A water-absorptive contact lens made of a copolymer consisting essentially of:

(a) from about 50 to about 95 parts, by weight of the total monomer units, of hydrophilic monomer units consisting essentially of from about 25 to 100 parts, by weight of the total hydrophilic monomer units, of N-methyl-3-methylene-2-pyrrolidone represented by the formula:



(I)

and from 0 to about 75 parts, by weight of the total hydrophilic monomer units, of N-vinyl-2-pyrrolidone; and

(b) from about 5 to about 50 parts, by weight of the total monomer units, of reinforcing monomer units consisting essentially of at least one monomer selected from the group consisting of alkyl acrylates, alkyl methacrylates, styrene, alkyl styrenes, benzyl acrylate and benzyl methacrylate.

4,547,544

METHOD AND COMPOSITION FOR AIR BLADDER RELEASE DURING TIRE PRODUCTION

John M. Allardice, Allison Park, Pa., assignor to Releasomers, Inc., Bradfordwoods, Pa.

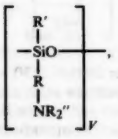
Continuation of Ser. No. 133,689, Mar. 25, 1980, abandoned. This application Nov. 6, 1981, Ser. No. 319,098

Int. Cl.[4] C08K *5/54*

U.S. Cl. 524—267 **5 Claims**

1. A release composition for the application to expandable items, comprising: a fluid blend having release properties enduring multiple repetitions of expansion and contraction of the expandable item, said fluid blend comprising from about 20 to about 80 parts of an adhesion agent, from about 4 to about 25 parts of a curing agent, from about 5 to about 80 parts of a slip agent, and from about 20 to about 80 parts of a release agent;

wherein said adhesion agent is an amino-functional diorganopolysiloxane resin having the following formula:

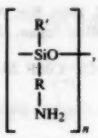


where v is a number up to 20,000; where R represents a divalent radical selected from the group consisting of a divalent hydrocarbon radical having from 1 to 10 carbon atoms, $(OCH_2)_r$, $(OC_2H_4)_r$, $(OC_3H_6)_r$, where r is a number from 1 to 50, and an unsaturated divalent hydrocarbon radical having from 2 to 10 carbon atoms;

where R′ represents a monovalent radical having from 1 to 18 carbon atoms and selected from the group consisting of: hydrocarbons and halogenated hydrocarbons, where R″ is selected from the group consisting of hydrogen, and a monovalent hydrocarbon radical having from 1 to 12

carbon atoms, R'' being the same or different in bonding to N;

said curing agent having the following formula:



where n is a number up to 30, where R represents the same divalent radicals as described in said formula for said adhesion agent, and where R' represents the same monovalent radicals as described in said formula for said adhesion agent;

said slip agent selected from the group consisting of polyalkylene glycols and di-organopolysiloxane fluids, and combinations thereof, said polyalkylene glycols having the following formula:

$$HO[-R'''-O-]_tC_2H_4OH,$$

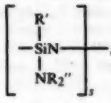
where R''' is an alkylene radical or an alkoxy-substituted alkylene radical having from 1 to 8 carbon atoms, and combinations thereof, and where t is a number from 2 to 80;

said di-organopolysiloxane fluids having the following formula:

where w is a number greater than 5 and where R' represents the same monovalent radicals as described in said formula for said adhesion agent;

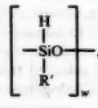
wherein said di-organopolysiloxane fluids have a viscosity range from about 100,000 to about 2,500,000 centipoise; and

said release agent selected from the group consisting of silazane fluids, mono-organopolysiloxane fluids and combinations thereof, said silazane fluids having the following formula:



where s is a number from 1 to 30, where R' represents the same monovalent radicals as described in said formula for said adhesion agent, and where R'' represents hydrogen and the same monovalent radicals as described in said formula for said adhesion agent;

said mono-organopolysiloxane fluids having the following formula:



where w is a number greater than 5 and where R' represents the same monovalent radicals as described in said formula for said adhesion agent.

4,547,545

HIGH DENSITY INFORMATION RECORD MADE OF A CONDUCTIVE RESIN COMPOSITION COMPRISING A SPECIFIC TYPE OF DIMETHYLPOLYSILOXANE

Toshiaki Hamaguchi; Kazuhira Namikawa, both of Yokohama; Toshikazu Goshima, Sagamihara; Mutsuaki Nakamura; Akio Kuroda, both of Yokohama, and Yoshiaki Kudo, Tokyo, all of Japan, assignors to Victor Company of Japan, Ltd. and Shin-Etsu Chemical Co., Ltd., both of, Japan

Filed Apr. 13, 1984, Ser. No. 603,761

Claims priority, application Japan, Apr. 20, 1983, 58-68447

Int. Cl.[4] C08K *5/54*

U.S. Cl. 524—269 **4 Claims**

1. A high density information record of the electrostatic capacitance type which comprises a record substrate on which signal information is recorded as geometric variations, the substrate being made of a conductive resin composition comprising a thermoplastic resin selected from the group consisting of vinyl chloride resins, vinyl chloride-vinyl acetate copolymers, vinyl chloride-propylene copolymers, acrylonitrile-styrene-vinyl chloride copolymers, and ethylene-vinyl acetate copolymers grafted with vinyl chloride, a conductive material in an amount of from 5 to 30 percent by weight based on the amount of the thermoplastic resin, and a dimethylpolysiloxane lubricant having a degree of inhomogeneity of 1.0 to 1.3 and a degree of polymerization 12 to 60, the lubricant being present in an amount of 0.3 to 2.0 percent by weight based on the thermoplastic resin.

4,547,546

ADDITIVE DISPERSIONS AND PROCESS FOR THEIR INCORPORATION WITH FIBER-FORMING POLYMER

Rodney L. Wells, Chester, Va., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 27, 1983, Ser. No. 507,875

Int. Cl.[4] C08K *5/10*; **D06M** *13/00, 13/20*

U.S. Cl. 524—313 **10 Claims**

1. In a process for melt-spinning yarn from fiber-forming polyamide polymer, the improvement comprising: adding to the polymer, prior to spinning, a dispersion comprising:

(a) 20 to 79.9 weight percent of at least one polymer additive having an average diameter of up to 50 microns at a temperature of 25° C.;

(b) 20 to 79.9 weight percent of a carrier selected from the group consisting of

(i) a glyceride which is non-resin forming when exposed to temperatures of up to 280° C. and pressures of up to 4000 psig (27 600 kPa) for up to 30 seconds, and which has an average molecular weight of between about 600 and 2400;

(ii) a C_5–C_{26} fatty acid ester of pentaerythritol; and

(iii) a C_5–C_{26} fatty acid ester of dipentaerythritol; and

(c) 0.1 to 2 weight percent of a thickener selected from the group consisting of:

(i) dibenzylidene sorbitol; and

(ii) silica having an ultimate particle size of 7 to 14 nanometers (nm).

4,547,547

POLYMER BLENDS

Augustin T. Chen, Cheshire, and Kemal Onder, North Haven, both of Conn., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 1, 1983, Ser. No. 557,029

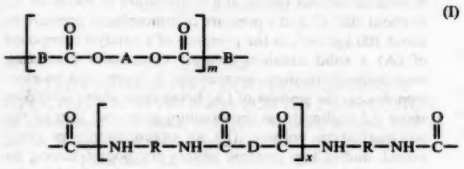
Int. Cl.[4] C08L *67/02*

U.S. Cl. 524—538 **16 Claims**

1. A fluxed polymer blend comprising

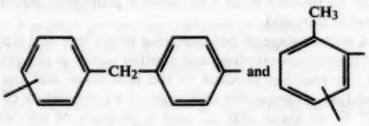
(a) from 95 to 50 percent by weight of a polyalkylene terephthalate; and, as the balance of said blend,

(b) a segmented polyesteramide characterized by a melt temperature no greater than 300° C. and by a recurring unit of the formula



(I)

wherein R is selected from the class consisting of arylene of the formulae:



and mixtures thereof, A is the residue of a polymeric diol HO—A—OH having a molecular weight from about 400 to about 4000, B is the residue of a dicarboxylic acid HOOC—B—COOH selected from the class consisting of aliphatic dicarboxylic acids having from 6 to 14 carbon atoms, inclusive, and isophthalic and terephthalic acids, m has a mean value of not more than 1 but greater than 0, D is the residue of a dicarboxylic acid HOOC—D—COOH such that the melt temperature of the hard segment is not greater than 280° C., and x is a number having an average value from zero to 10.

4,547,548

POLYMERIC COMPOUNDS CONTAINING PIPERIDINE AND TRIAZINE RADICALS, PROCESS FOR THEIR PREPARATION, AND THEIR USE AS STABILIZERS FOR SYNTHETIC POLYMERS

Giuseppe Cantatore, Bitonto, Italy, assignor to Ciba-Geigy S.p.A., Origgio, Italy

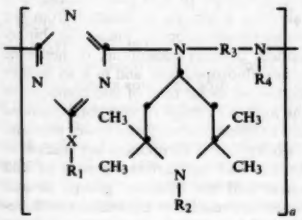
Filed Jul. 19, 1984, Ser. No. 633,424

Claims priority, application Italy, Jul. 19, 1983, 22137 A/83

Int. Cl.[4] C08L *23/121*

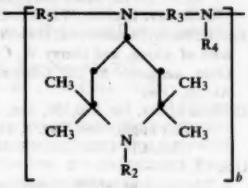
U.S. Cl. 525—186 **6 Claims**

1. Compound of the general formula (I)

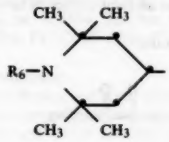


(I)

-continued



in which R_1 is hydrogen, C_1–C_{18}-alkyl, C_2–C_{12}-alkyl substituted by —OH, by C_1–C_{18}-alkoxy or by C_2–C_{18}-dialkylamino, or is C_3–C_{18}-alkenyl, C_5–C_{18}-cycloalkyl, C_6–C_{18}-aryl, C_7–C_{18}-aralkyl or a radical of the formula (II)



(II)

where R_6 is hydrogen, C_1–C_{12}-alkyl, C_3–C_{12}-alkenyl or alkynyl, C_7–C_{12}-aralkyl or C_1–C_{12}-acyl, X is —O—, —S— or a radical

in which R_7 is as defined for R_1, R_1X taken as a single substituent group can also be a heterocyclic radical, such as pyrrolidin-1-yl, piperidin-1-yl, hexahydroazepin-1-yl, morpholin-4-yl or 4-methyl-piperazin-1-yl, R_2 is as defined for R_6, R_3 is C_2–C_{18}-alkylene, C_4–C_{18}-alkylene substituted by 1 or 2 oxygen or nitrogen atoms, C_5–C_{18}-cycloalkylene, C_6–C_{18}-arylene or C_7–C_{18}-aralkylene, R_4 is C_5–C_{18}-cycloalkyl, C_6–C_{18}-aryl, C_7–C_{18}-aralkyl or a radical of the formula (II), and R_5 is C_3–C_{18}-hydroxyalkylene, C_4–C_8-alkenylene, C_8–C_{18}-aralkylene, carbonyl, C_2–C_{18}-diacyl, C_4–C_{18}-dicarbamoyl, C_1–C_{18}-alkylene-carbonyl or a radical of the formula (III)

(III)

in which R_8 is C_2–C_{18}-alkylene, C_4–C_{18}-oxaalkylene, C_6–C_{18}-cycloalkylene, C_6–C_{18}-arylene or C_8–C_{18}-aralkylene, the ratio a:b being between 4:1 and 1:4, and the number average molecular weight $\bar{M}n$ being between 1000 and 20,000.

4,547,549

PROCESS FOR PRODUCING POWDERY COMPOSITE POLYMER

Mamoru Nakamura, and Fumio Shibata, both of Takaoka, Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Feb. 5, 1985, Ser. No. 698,681

Claims priority, application Japan, Feb. 6, 1984, 59-19764

Int. Cl.[4] C08L *27/06, 33/18*

U.S. Cl. 525—197 **6 Claims**

1. A process for producing a powdery composite polymer, which comprises mixing in an aqueous medium (A) a particulate vinyl chloride polymer, (B) an elastomer containing a nitrile group and (C) a solvent for the elastomer (B) which is not miscible with water and is a poor solvent for the polymer (A), thereafter removing the solvent (C) from the mixture, and dehydrating and drying the mixture thereby to form a powdery composite polymer composed of the vinyl chloride polymer (A) and the nitrile group-containing elastomer (B).

4,547,550

ACRYLATE TERPOLYMERS AND FLEXIBLE THERMOPLASTIC VINYL CHLORIDE POLYMERS

Earl G. Melby, Uniontown; Hubert J. Fabris; Russell A. Livigni, both of Akron, and Harry W. Cocain, Cuyahoga Falls, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

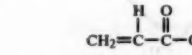
Division of Ser. No. 570,730, Jan. 13, 1984, Pat. No. 4,511,699. This application Nov. 7, 1984, Ser. No. 669,169

Int. Cl.[4] C08F 220/12, 220/16; C08L 27/06

U.S. Cl. 525—205 **10 Claims**

1. The method which comprises aqueous free radical emulsion copolymerizing polymerizable monomers consisting essentially of A, B and C to form a terpolymer in which the relative ratios of A, B and C to each other on a percent by weight basis are from about 24 to 94 of A, from about 1 to 75 of B and from about 1 to 20 of C, the total of A, B and C being 100, said emulsion optionally additionally containing a chain transfer agent in a minor amount sufficient to avoid formation of gel,

where A has the formula



where R is an alkyl group of from 4 to 8 carbon atoms and mixtures of A, said A as a homopolymer having a Tg not above −20° C.,

where B is selected from the group consisting of methyl acrylate and ethyl acrylate and mixtures of the same and

where C is selected from the group consisting of acrylonitrile, methacrylonitrile, N-vinyl-2-pyrrolidone and vinyl-alpha-methyl pyrrolidone and mixtures of the same.

4,547,551

ETHYLENE POLYMER BLENDS AND PROCESS FOR FORMING FILM

Fay W. Bailey, and William M. Whitte, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 391,056, Jun. 22, 1982, Pat. No. 4,461,873. This application Jun. 25, 1984, Ser. No. 624,315

Int. Cl.[4] C08L 23/18, 23/06

U.S. Cl. 525—240 **11 Claims**

1. Process to produce an ethylene polymer film comprising extruding a fluid ethylene polymer blend, the polymer component of which consists essentially of

(a) 40–70 parts by weight of a high molecular weight ethylene polymer having a high load melt index (HLMI) in the range of about 0.1 to about 1.5 g/10 min and a density in the range of 0.930 to 0.940 g/cc, and having a heterogeneity index of <10, and

(b) 60-30 parts by weight of a low molecular weight ethylene polymer having a melt index (MI) in the range of 45–300 g/10 minutes and a density of above about 0.950 and having a heterogeneity index of <6.

4,547,552

PROCESS FOR PRODUCING A CHEMICALLY BLENDED PROPYLENE POLYMER COMPOSITION AND THE COMPOSITION PRODUCED BY SAID PROCESS

Akinori Toyota, and Norio Kashiwa, both of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 428,142, Sep. 29, 1982, abandoned. This application Dec. 10, 1984, Ser. No. 680,227

Claims priority, application Japan, Nov. 13, 1981, 56-181018

Int. Cl.[4] C08F 297/08

U.S. Cl. 525—247 **13 Claims**

1. A process for producing a chemically blended propylene polymer composition having an ethylene content ranging from 3 to 40% by weight and being greater than the weight of the rubbery propylene copolymer formed in stage (II) below, which comprises the following stages (I) and (II):

(I) a first stage of polymerizing propylene containing 0 to 5 mole% of another olefin, at a temperature of about 20° C. to about 200° C. and a pressure of atmospheric pressure to about 100 kg/cm^2, in the presence of a catalyst composed of (A) a solid titanium catalyst component consisting essentially of titanium, magnesium, halogen, and an electron donor, the amount of (A) being from about 0.0005 to about 0.5 millimole, as the titanium atom, per liter of the polymerization volume, (B) an organoaluminum compound, and (C) an organic silicon compound having an Si—O—C bond in which the atomic ratio of Al in the component (B) to Ti in the component (A) is from about 1 to about 2000 and the mole ratio of the component (C) to Ti in the component (A) is from about 0.05 to about 200, to thereby form a crystalline propylene polymer or copolymer; and

(II) a second stage of polymerizing propylene and ethylene, or propylene, ethylene and another olefin in the presence of the reaction product of the first stage and the same catalyst as used in the first stage, at a temperature of about 20° C. to about 200° C. and a pressure of atmospheric pressure to about 100 kg/cm^2, to form a rubbery propylene copolymer and a crystalline ethylene polymer or copolymer.

4,547,553

POLYBUTADIENE MODIFIED POLYESTER COMPOSITIONS

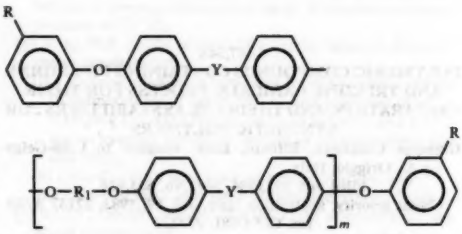
Hyman R. Lubowitz, Rolling Hills Estates, Calif., and Clyde H. Sheppard, Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 402,932, Jul. 29, 1982, abandoned. This application Apr. 22, 1985, Ser. No. 725,515

Int. Cl.[4] C08G 63/54

U.S. Cl. 525—384 **21 Claims**

1. An oligomer formed by reacting: a polybutadiene component selected from the group consisting of hydroxy terminated polybutadiene, carboxy terminated polybutadiene, and mixtures thereof; and a phenoxyphenyl component having the formula



wherein Y is selected from the group consisting of sulfone, sulfoxide, sulfide, carbonyl, and perfluoroisopropanyl, R is selected from the group consisting of acid chloride, carboxy, hydroxy and lower aliphatic ester, R_1 is selected from the group consisting of diphenyleneisopropane, phenylene, biphenylene, diphenylenesulfide, diphenylenesulfone, diphenylene ether, and diphenylenehexafluoropropane, and m is an integer of from 0 to 4; and wherein the molar ratio of said components is selected such that the hydroxy groups of said polybutadiene component and the acid chloride, carboxy and lower aliphatic ester groups of said phenoxyphenyl component are reacted at equivalents or thereabouts, and the carboxy groups of said polybutadiene component and the hydroxy groups of said phenoxyphenyl component are reacted at equivalents or thereabouts; and wherein said polybutadiene component constitutes

from about 1 to about 25% by weight of the oligomer; and the molecular weight of the oligomer is between about 5,000 and about 40,000.

4,547,554

AFTER-CHLORINATED ETHYLENE/BUTENE-1 COPOLYMER AND PROCESS FOR ITS PRODUCTION

Seiji Kadomatsu, Toyonaka, and Kozo Misumi, Sennan, both of Japan, assignors to Osaka Soda Co., Ltd., Osaka, Japan

Filed Jun. 22, 1983, Ser. No. 506,877
Claims priority, application Japan, Jun. 25, 1982, 57-108454
Int. Cl.[4] C08F *8/22*
U.S. Cl. 525—334.1 **5 Claims**

1. An after-chlorinated ethylene/butene-1 copolymer characterized by having

(a) 1 to 2 methyl groups per 100 carbon atoms,

(b) a chlorine content of 25 to 35% by weight,

(c) a weight average molecular weight of not less than 100,000,

(d) a heat of fusion, determined by differential scanning calorimetry, of not more than 0.5 cal/g, and

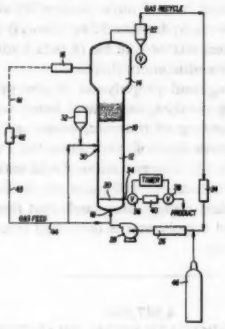
(e) an ethylene content of 93 to 97% by weight and a butene-1 content of 7 to 3% by weight.

4,547,555

METHOD FOR RAPID KILL GAS INJECTION TO GAS PHASE POLYMERIZATION REACTORS DURING POWER FAILURES

John E. Cook, Westfield; Robert O. Hagerty, Edison, both of N.J., and Frederick W. Jacob, Houston, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 1, 1983, Ser. No. 528,498
Int. Cl.[4] C08F *2/00, 2/38*; C08G *85/00*
U.S. Cl. 526—60 **16 Claims**



1. A method for terminating a gas phase fluid bed or stirred bed olefin polymerization reaction during a power failure, said olefin polymerization reaction taking place in the presence of a transition metal-based catalyst system in a reactor having a gas recycle line means equipped with a compressor, said compressor producing a coast-down flow of recycle gas for at least one minute during the power failure, said method comprising injecting within 10 to 30 seconds after said power failure an amount of kill gas into said recycle line means sufficient to terminate the olefin polymerization reaction, whereby said kill gas is carried into the reaction medium by said coast-down flow of the recycle gas during said power failure.

4,547,556

AIR-CURING ACRYLIC POLYMERS

Kathleen A. Hughes, Plymouth Meeting, and Graham Swift, Blue Bell, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 25, 1982, Ser. No. 436,258
Int. Cl.[4] C09D *3/81, 5/40, 5/02*; C08L *91/00*
U.S. Cl. 526—75 **13 Claims**

1. A composition comprising a water reducible vinyl addition polymer having pendant unsaturated air drying fatty acid ester groups and additional pendant groups selected from secondary amine, tertiary amine, and combinations thereof.

4,547,557

SILICA-TITANIA COGEL FROM TWO-STEP HYDROLYSIS

Max P. McDaniel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 9, 1984, Ser. No. 629,152
Int. Cl.[4] C08F *4/02, 10/02*
U.S. Cl. 526—106 **25 Claims**

1. A method comprising:

(a) partially hydrolyzing a silicate ester comprising at least one of an organopolysilicate and a tetraorganoxysilicate in an organic solvent under alkaline conditions using less than the stoichiometric amount of water required for complete hydrolysis;

(b) thereafter combining the partially hydrolyzed product of (a) with a titanium tetraalkoxide; thereafter

(c) adding sufficient water to complete the hydrolysis and produce a silica sol; and

(d) combining said silica sol with sufficient base to form a silica-titania gel.

22. A method comprising:

(a) partially hydrolyzing a silicate ester comprising at least one of an organopolysilicate and a tetraorganoxysilicate in an organic solvent under alkaline conditions using less than the stoichiometric amount of water required for complete hydrolysis;

(b) thereafter combining the partially hydrolyzed product of (a) with a titanium tetraalkoxide; thereafter

(c) adding sufficient water to complete the hydrolysis and produce a silica sol; thereafter

(d) combining said silica sol with sufficient base to form a silica-titania gel; thereafter

(e) drying said gel to form a xerogel, said xerogel also containing a chromium compound;

(f) contacting at least one mono-1-olefin having 2 to 8 carbon atoms per molecule in a reaction zone under polymerization conditions with said xerogel; and

(g) recovering a polymer.

4,547,558

FLUOROACRYLIC COPOLYMER

Shouji Iwatsuki, Aichi, Japan, assignor to Daikin Kogyo Company Limited, Osaka, Japan

Filed Feb. 27, 1984, Ser. No. 583,673
Claims priority, application Japan, Mar. 7, 1983, 58-37859
Int. Cl.[4] C08F *214/18*
U.S. Cl. 526—245 **3 Claims**

1. A fluoroacrylic copolymer comprising an acrylic acid derivative of the formula

$$\begin{array}{l} (CH_2)_aRf \\ | \\ CH_2{=}C{-}COO(CH_2)_bRf' \end{array} \qquad (I)$$

wherein Rf and Rf', which may be the same or different, are each a perfluoroalkyl group of 3 to 21 carbon atoms, a is an integer of 2 to 10 and b is an integer of 1 to 10, and a copolymerizable monomer selected from the group consisting of acrylic acid, methacrylic acid, maleic anhydride, olefins, vinyl

esters, vinylidene halogenides, acrylates, methacrylates, vinyl alkyl ketones and vinyl alkyl ethers, wherein the content of the acrylic acid derivative in the copolymer is about 0.01 to 10 mole percent.

4,547,559

ACRYLATE/MALEATE COPOLYMERS, THEIR PREPARATION AND USE AS ANTISCALANTS

Stanley W. Walinsky, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 232,475, Feb. 9, 1981, Pat. No. 4,390,670. This application Mar. 18, 1983, Ser. No. 476,668

The portion of the term of this patent subsequent to Jun. 28, 2000, has been disclaimed.

Int. Cl.[4] C08F *120/08*

U.S. Cl. 526—271 **2 Claims**

1. A substantially homogeneous copolymer consisting essentially of from about 35 to 65 mole percent acrylic or methacrylic acid units and from about 65 to 35 mole percent maleic anhydride units and having a number average molecular weight of from about 500 to 5000.

4,547,560

RANDOM STYRENE-BUTADIENE COPOLYMER RUBBER

Yasuo Hattori; Hideo Morita, both of Yokohama, and Yoshihiro Inoki, Kawasaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 329,368, Dec. 10, 1981, abandoned. This application Mar. 18, 1983, Ser. No. 474,733

Claims priority, application Japan, Dec. 16, 1980, 55-177698

Int. Cl.[4] C08F *236/10*

U.S. Cl. 526—340 **8 Claims**

1. A random styrene-butadiene copolymer rubber, comprising 10% to 40% by weight of styrene units and the balance comprising butadiene units and having a Mooney viscosity of 30 to 150, which copolymer rubber is characterized in that the content of the butadiene units having a 1,2-vinyl structure is from 16 to 48% based on the entire amount of said butadiene units in said copolymer; the heterogeneity index represented by the ratio of the weight average molecular weight $\overline{Mw}$ to number average molecular weight $\overline{Mn}$ of said copolymer is in the range of from 1.5 to 3.0; the content of the isolated sytene units and the content of the styrene units in the form of long chain blocks of at least 8 styrene units are 50% or more and 5% or less, respectively, based on the entire weight of said styrene units in said copolymer, which contents have been determined by decomposing said copolymer with ozone and by subjecting said ozone-decomposition product to a gel permeation chromatographic analysis.

4,547,561

CONSTRUCTION MATERIAL WHICH CAN BE SHAPED UNDER THE INFLUENCE OF HEAT, A PROCESS FOR ITS PREPARATION AND ITS USE

Christian Wegner, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 27, 1984, Ser. No. 635,957

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1983, 3329392

Int. Cl.[4] C08G *18/48*

U.S. Cl. 528—60 **25 Claims**

1. A polyurethane constructional material which is hard and has high impact strength at temperatures below about 45° C. but is softened to a manually shapable state by exposure to temperatures in excess of about 60° C. comprising the reaction product of

a) an isocyanate component comprising at least one diisocyanate which:

i) contains at least one cycloaliphatic or aromatic residue in its molecular structure; and

ii) has both of its isocyanate groups bound to other than an aryl carbon atom; with

b) a polyol component comprising at least one polyether which:

i) is built up predominantly from propylene oxide units;

ii) has a number average molecular weight of between about 350 and 1000; and

iii) has an OH number between about 250 and 600, said reaction product being synthesized using an NCO to OH ratio of between about 0.75:1 and 1.25:1.

4,547,562

SOLVENTLESS POLYMERIC COMPOSITION COMPRISING NON ARYLAMINE, POLYACRYLATE AND EPOXIDE

Gus Nichols, 3500 Becker Dr. #8, Dickenson, Tex. 77539

Filed Mar. 26, 1984, Ser. No. 593,591

Int. Cl.[4] C08G *83/00*

U.S. Cl. 528—119 **21 Claims**

1. A copolymer comprising the addition reaction product of: a first, solventless component comprising non-aryl or non-arylalkyl mono, di or polyamines, or mixtures thereof; and a second, solventless component comprising a mixture of di or polyacrylates and mono, di or polyfunctional epoxides.

4,547,563

COPOLYESTER OF POLYETHYLENE TEREPHTHALATE AND BIS (4-BETA HYDROXY ETHOXY PHENYL) SULFONE

Michael S. Cholod, Cornwells Heights, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 466,246, Feb. 14, 1983, abandoned. This application Dec. 5, 1983, Ser. No. 558,083

Int. Cl.[4] C08G *63/66, 63/68*

U.S. Cl. 528—173 **9 Claims**

1. A process for preparing a copolyester of polyethylene terephthalate comprising:

(1) preparing a polyethylene terephthalate prepolymer by the ester interchange reaction of ethylene glycol, dimethyl terephthalate, and from 3 mole percent to about 5 mole percent bis (4-beta hydroxy ethoxy phenyl) sulfone, isomers thereof, and mixtures of bis (4-beta hydroxy ethoxy phenyl) sulfone and isomers thereof:

(2) polycondensing said prepolymer in the presence of a metalcontaining catalyst, said metal being selected from the group consisting of titanium, antimony, tin, germanium and mixtures thereof, and when the catalyst comprises antimony, the concentration of said antimony metal is from about 40 to about 150 parts per million based on the weight of said copolyester, such that the crystallization time of said copolyester is increased from about 7 to about ten minutes.

4,547,564

POLYESTER CARBONATE FROM BRANCHED CHAIN ALKYLIDENE DIHYDRIC PHENOL

Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Division of Ser. No. 453,104, Dec. 27, 1982, Pat. No. 4,469,861. This application Apr. 12, 1984, Ser. No. 599,661

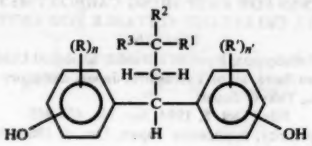
Int. Cl.[4] C08G *63/62*

U.S. Cl. 528—176 **16 Claims**

1. A composition comprising at least 1 thermolastic polymer derived from

(i) a carbonate precursor;

(ii) at least one dihydric phenol represented by the general formula



wherein:

R is independently selected from halogen radicals or monovalent hydrocarbon radicals;

R′ is independently selected from halogen radicals or monovalent hydrocarbon radicals;

R^1 is selected from alkyl radicals or hydrogen;

R^3 is selected from alkyl radicals or hydrogen;

R^2 is selected from alkyl radicals, with the proviso that when R^1 and R^3 are both hydrogen then R^2 is selected from branched alkyl radicals containing at least three carbon atoms; and

n and n′ are independently selected from whole numbers having a value of from 0 to 4 inclusive; and

(iii) at least one difunctional carboxylic acid or an ester forming reactive derivative thereof.

4,547,565

METHOD FOR MANUFACTURING TRIOXANE COPOLYMER

Takuzo Kasuga, Tokyo; Takeshi Asano, Fuji; Yukio Ikenaga, Fuji; Masami Yamawaki, Fuji; Yasuyuki Takeda, Fuji, and Koichi Ichimura, Fuji, all of Japan, assignors to Polyplastics Company, Ltd., Osaka, Japan

Filed Jun. 8, 1984, Ser. No. 618,717

Claims priority, application Japan, Jun. 17, 1983, 58-109052

Int. Cl.⁴ C08G *2/10*

U.S. Cl. 528—232 **12 Claims**

1. A method for manufacturing a trioxane copolymer, comprising the steps of: (1) adding to trioxane and at least one co-monomer which is co-polymerizable with trioxane, 0.001 to 2.0 percent by weight, based on the total weight of the monomers, of one or more sterically hindered phenols, and then (2) co-polymerizing the resultant mixture in the presence of a cation-active catalyst, and then (3) treating the resultant copolymer by heating to a temperature which is higher than the melting point of the copolymer to melt the copolymer and decompose and remove unstable parts of the copolymer.

4,547,566

COPPER, COBALT, NICKEL AND IRON COMPLEXES OF DISAZO DYES

Udo Bergmann, Darmstadt; Guenter Hansen, Ludwigshafen, and Georg Zeidler, Dannstadt-Schauernheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

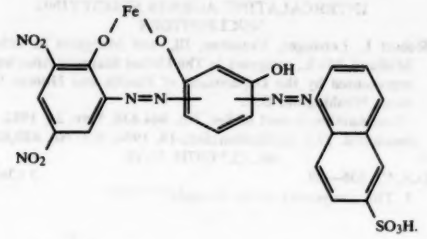
Filed Mar. 23, 1983, Ser. No. 478,101

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1982, 3212240

Int. Cl.⁴ C09B *45/26, 45/58, 45/30, 45/32*

U.S. Cl. 534—684 **1 Claim**

1. The complex having the formula



4,547,567

DERIVATIVES OF 4′-DEMETHYL-4-EPIPODOPHYLLOTOXIN

Hamao Umezawa; Tomio Takeuchi, both of Tokyo; Shinichi Kondo, Yokohama; Wataru Tanaka, Houya; Tomohisa Takita, Asaka; Yoshio Nishimura, Yokohama, and Hiroshi Yoshikawa, Fujioka, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

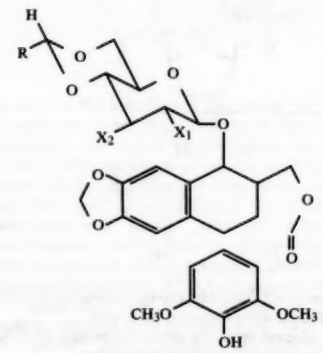
Filed Jul. 18, 1984, Ser. No. 631,999

Claims priority, application Japan, Jul. 29, 1983, 58-137687

Int. Cl.⁴ C07H *15/24*

U.S. Cl. 536—17.2 **4 Claims**

1. A novel 4′-demethyl-4-epipodophyllotoxin derivative represented by the formula, or a salt thereof:



wherein R is a lower alkyl group, and X_1 and X_2 are independently a hydroxyl group or an amino group, when one is an amino group the other is a hydroxyl group.

4,547,568

3-O-(3-P-METHYLPHENYL-3-OXO)PROPIONYL GLUCOPYRANOSE AND RELATED COMPOUNDS

Woontung G. Chan, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 417,217, Sep. 13, 1982, Pat. No. 4,481,956. This application Jul. 13, 1984, Ser. No. 605,370

Int. Cl.⁴ A61K *15/18, 17/04*

U.S. Cl. 536—18.2 **3 Claims**

1. 1,2:5,6-Di-O-isopropylidene-3-O-(3-p-methylphenyl-3-oxo)propionyl-α-D-glucofuranose.

4,547,569

INTERCALATING AGENTS SPECIFYING NUCLEOTIDES

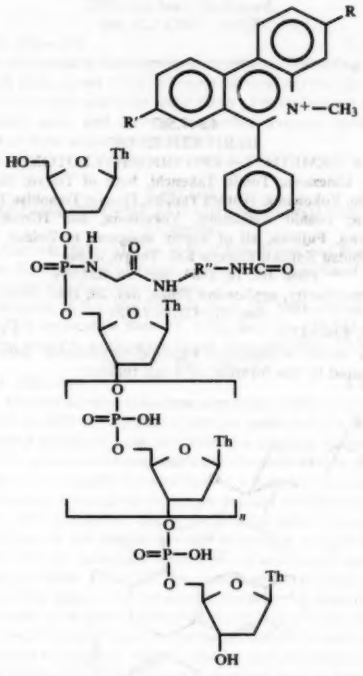
Robert L. Letsinger, Evanston, Ill., and Margaret E. Schott, Midland, Mich., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 444,438, Nov. 24, 1982, abandoned. This application Jun. 14, 1984, Ser. No. 620,801

Int. Cl.⁴ C07H *19/10*

U.S. Cl. 536—29 **3 Claims**

1. The compound of the formula



where R is selected from the group consisting of —NH_2, methylamino, or ethylamino or hydrogen;

where R' is selected from the group consisting of —NH_2, methylamino, or ethylamino or hydrogen;

where the chain linking the linker group to the phenanthridinium group (R") consists of 2–8 —CH_2—groups;

where Th is thymidylyl thymidine; and

where n is an integer from 0–19.

4,547,570

PROCESS FOR PREPARING CELLULOSE ETHERS

Joseph L. Garner, Sanford, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 20, 1983, Ser. No. 543,693

Int. Cl.⁴ C08B *11/00, 11/02*

U.S. Cl. 536—84 **15 Claims**

1. In an etherification process for preparing cellulose ethers wherein alkali cellulose is reacted with an etherifying agent which also reacts with water, the improvement comprising removing water by distillation, during the reaction, whereby the efficiency of the etherification reaction is improved.

4,547,571

PROCESS FOR PREPARING CARBOXYMETHYL ETHYL CELLULOSE SUITABLE FOR ENTERIC COATING

Hideaki Mukohyama; Ryoichi Hiraoka; Shohachi Ushijima, and Motoyasu Saito, all of Yatsushiro, Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1984, Ser. No. 657,865

Claims priority, application Japan, Oct. 6, 1983, 58-185978; Apr. 18, 1984, 59-76582

Int. Cl.⁴ C08B *11/193, 11/08*

U.S. Cl. 536—90 **6 Claims**

1. A process for preparing carboxymethyl ethyl cellulose suitable for enteric coating which comprises:

(1) adding an alkali metal hydroxide to a dispersion of carboxymethyl cellulose in an organic solvent and subjecting the dispersion to a reaction with an ethyl halide in the presence of a phase transfer catalyst to produce carboxymethyl ethyl cellulose, said carboxymethyl cellulose having a degree of substitution of carboxymethyl group of 0.2 to 1.2, and said organic solvent being substantially immiscible with an aqueous solution of the alkali metal hydroxide and capable of dissolving the ethyl halide.

(2) dissolving carboxymethyl ethyl cellulose in an aqueous solution of a basic compound selected from the group consisting of ammonia, a water-soluble amine and an alkali metal hydroxide, and subjecting the resulting solution to depolymerization in the presence of a peroxide,

(3) neutralizing the resulting basic solution of the depolymerized carboxymethyl ethyl cellulose with an acidic substance in the presence of an alkyl alcohol having 1 to 3 carbon atoms or acetone to form a hydrogel of carboxymethyl ethyl cellulose, and subjecting the hydrogel to dehydration with agitation at a temperature not lower than the temperature at which dehydration occurs, followed by isolation and washing with water, and

(4) drying the wet carboxymethyl ethyl cellulose.

4,547,572

CYCLODEXTRIN POLYMERS SWELLING QUICKLY AND TO A GREAT EXTENT IN WATER AND PROCESS FOR THE PREPARATION THEREOF

Éva Fenyvesi; József Szejtli; Béla Zsadon; Balázs Antal, and Ildikó Wágner née Kohary, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

Filed Feb. 6, 1984, Ser. No. 577,153

Claims priority, application Hungary, Feb. 4, 1983, 387/83

Int. Cl.⁴ C08B *37/16*

U.S. Cl. 536—103 **13 Claims**

1. A cyclodextrin-epichlorohydrin polymer swelling quickly and to a great extent in water and containing as an alcohol additive a compound selected from the group consisting of n-octanol, ethylene glycol, propylene glycol, butylene glycol, triethylene glycol, and tetraethylene glycol.

4,547,573

PROCESS FOR PREPARING CEPHALOSPORIN DERIVATIVES

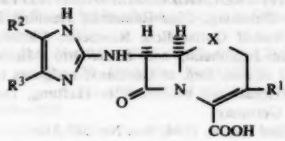
Fréderic H. Jung, Rilly la Montagne; Annie A. Olivier, Reims, both of France, and Frank Loftus, Macclesfield, England, assignors to ICI Pharma, Enghien-les-Bains, France and Imperial Chemical Industries PLC, London, England

Filed Dec. 2, 1983, Ser. No. 557,585

Int. Cl.⁴ C07D *501/14*; A61K *31/545*

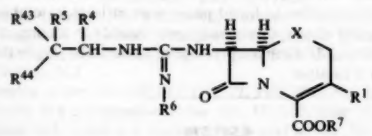
U.S. Cl. 544—27 **2 Claims**

1. A process for the manufacture of a cephalosporin derivative of the formula I:



I

wherein X is sulphur; R^1 is hydrogen, chlorine, methyl, acetoxymethyl, methoxymethyl, hydroxymethyl, azidomethyl, aminomethyl, benzoyloxymethyl, acetylaminomethyl, carbamoyloxymethyl, 2-(1-methyltetrazol-5-ylthio)-transvinyl, 1-methyl-1H-tetrazol-5-ylthiomethyl, 1-carboxymethyl-1H-tetrazol-5-ylthiomethyl, 1-(2-dimethylamino)ethyl-1H-tetrazol-5-ylthiomethyl, 1-sulphomethyl-1H-tetrazol-5-ylthiomethyl, 1-ixopropyl-1H-tetrazol-5-ylthiomethyl, 1-(2,2,2-trifluoro)ethyl-1H-tetrazol-5-ylthiomethyl, 1-phenyl-1H-tetrazol-5-yl-thiomethyl, 1-(2-methylthio)ethyl-1H-tetrazol-5-ylthiomethyl, 1,3,4-thiadiazol-2-ylthiomethyl, 5-methyl-1,3,4-thiadiazol-2-ylthiomethyl, 1,2,3-thiadiazol-5-ylthiomethyl, 1H-1,2,3-triazol-4-ylthiomethyl, 5-trifluoromethyl-1H-1,2,4-triazol-3-ylthiomethyl, 4,6-dimethylpyrimid-2-ylthiomethyl, 2-thiazolin-2-ylthiomethyl, benzoxazol-2-ylthiomethyl, benzthiazol-2-ylthiomethyl, 2-carboxyphenylthiomethyl, (6-carboxymethyl-7-hydroxypyrrolo[1,2-b]pyridazin-2-yl)thiomethyl, 2-methylthio-1,3,4-thiadiazol-5-ylthiomethyl, 2-mercapto-1,3,4-thiadiazol-5-ylthiomethyl, 2-acetylamino-1,3,4-thiadiazol-5-ylthiomethyl, 5-methyl-1,2,4-thiadiazol-2-ylthiomethyl, 2-sulphomethyl-1,2,4-oxadiazol-5-ylthiomethyl, 4-methyl-5-(3-carboxypropyl)thiazol-2-ylthiomethyl, 2H-2-methyl-1,2,3-triazol-4-ylthiomethyl, 1H-1,2,4-triazol-2-ylthiomethyl, 4,5-dihydro-6-hydroxy-4-methyl-5-oxo-1,2,4-triazin-3-ylthiomethyl, 2,5-dihydro-6-hydroxy-2-methyl-5-oxo-1,2,4-triazin-3-ylthiomethyl, 1-oxidopyrid-2-ylthiomethyl, imidazo[4,5-b]pyrid-2-ylthiomethyl or imidazo[4,5-d]pyrimidin-2-ylthiomethyl R^2 is hydrogen; R^3 is hydrogen; and the pharmaceutically-acceptable acid-addition and base-addition salts thereof, characterised by cyclisation of a compound of the formula XXV:

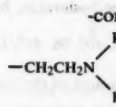


XXV

or an acid-addition salt thereof, in which X and R^1 have the meanings stated above, R^4 and R^5 individually have one of the values given above for R^2 and R^3, R^6 is a nitrogen-protecting group selected from a group of the formula $SiR^{30}R^{31}R^{32}$ or $CH_2OSiR^{30}R^{31}R^{32}$ in which R^{30}, R^{31}, and R^{32}, same or different, are 1–6C alkyl, phenyl or benzyl, of the formula CH_2OR^{33} in which R^3 is 1–6C alkyl, or R^6 is triphenylmethyl, tetrahydropyran-2-yl or tetrahydropyran-2-yloxymethyl; R^7 is hydrogen, t-butyl, diphenylmethyl, p-methoxybenzyl, benzyl, p-nitrobenzyl or 2,2,2-trichloroethyl or R^7 is trisubstituted silyl in which the substituents are selected from 1–6C alkyl, phenyl and substituted phenyl, or R^7 is of the formula XIII to XXIV inclusive:

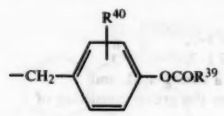
$-CHR^{36}OCOR^{37}$ XIII
$-CHR^{36}SCOR^{37}$ XIV
$-CHR^{36}COR^{37}$ XV
$-CHR^{36}OR^{37}$ XVI
$-COOR^{37}$ XVII
$-CHR^{36}OCOR^{37}$ XVIII

-continued

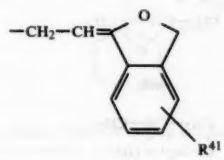


XIX

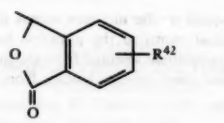
$-CHR^{36}OCH_2CH_2OCH_3$ XX
$-CH_2OCO(CH_2)_t-CHR^{38}-NH_2$ XXI



XXII



XXIII



XXIV

in which R^{36} is hydrogen or 1–6C alkyl, R^{37} is 1–6C alkyl, R^{38} is hydrogen, 1–6C alkyl, phenyl(1–6C)alkyl or 2–6C alkoxycarbonyl, t is 0 to 1, R^{39} is 1–6C alkyl, phenyl or phenyl(1–6C)alkyl, R^{40} is hydrogen or one, two or three radicals selected from halogen, nitro, cyano, 1–6C alkyl, 1–6C alkoxy, 1–6C alkylthio, 1–6C alkylsulphinyl, 1–6C alkanesulphonyl, 2–6C alkoxycarbonyl, 2–6C alkoxythiocarbonyl, 2–6C alkanoylamino, phenyl, phenoxy, phenylthio, phenylsulphinyl, phenylsulphonyl, phenoxycarbonyl, phenylthiocarbonyl, and phenoxythiocarbonyl, R^{41} is hydrogen or one of the values for R^{39} given above and R^{42} is hydrogen or one, two or three radicals selected from halogen, 1–6C alkyl and 1–6C alkoxy; R^{43} and R^{44}, same or different, are hydroxy, cyano or of the formula $NR^{45}R^{46}$ in which R^{45} and R^{46} are 1–6C alkyl or phenyl or are joined to form a ring or of the formula $OSiR^{47}R^{48}R^{49}$ in which R^{47}, R^{48} and R^{49}, same or different, are 1–6C alkyl, phenyl(1–6C)alkyl, or phenyl or R^{43} and R^{44} together are of the formula $R^{50}—ON=$ in which R^{50} is 1–6C alkyl or hydroxy or of the formula $R^{51}R^{52}NN=$ in which R^{51} and R^{52} are 1–6C alkyl or phenyl, or R^{43} is hydrogen and R^{44} is nitro, or R^{43} and R^{44} are of the formula A—R^{53} and B—R^{54} respectively in which A and B are oxygen, sulphur, sulphinyl or NH and R^{53} and R^{54} are joined to form an ethylene or propylene chain which is optionally substituted by one or two 1–6C alkyls, or when A and B are oxygen, sulphur or sulphinyl, R^{53} and R^{54}, same or different, are 1–6C alkyl, 1–6C alkanoyl, phenyl, or phenyl(1–6C)alkyl, thereafter, when R^7 is a substituent other than hydrogen, replacing said substituent with R^7 and thereafter, when the compound of formula I is obtained in the form of the free base or salt, and a pharmaceutically-acceptable salt or free base respectively is required, converting said base or salt to the salt or base.

4,547,574
QUATERNARY PYRAZINIUM COMPOUNDS

Drahomir Dvorsky, and Karel Cerovsky, both of Dvur Kralove nad Labem, Czechoslovakia, assignors to Vyzkumny ustav zuslechtovaci, Dvur Kralove nad Labem, Czechoslovakia

Division of Ser. No. 516,147, Jul. 21, 1983, Pat. No. 4,499,282, which is a division of Ser. No. 354,494, Mar. 3, 1982, abandoned. This application Nov. 6, 1984, Ser. No. 668,669

Claims priority, application Czechoslovakia, Mar. 4, 1981, 1537-81; Mar. 20, 1981, 2050-81

Int. Cl.[4] C07D *241/12, 405/06, 405/14*

U.S. Cl. 544—336 1 Claim

1. Quaternary ammonium compound of the formula

$$[Y-M-Y]^{k+}\ \frac{k}{n}\ X^{n-}$$

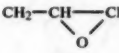
wherein:

k is an integer of 1–2,

n is an integer of 1–3,

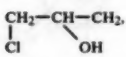
X is an anion of a strong acid, and

Y is selected from the group consisting of



(a)

and



(b)

said group being bound to the nitrogen atoms of a pyrazine ring M, the individual atoms of the pyrazine having bound thereto at least one substituent selected from the group consisting of hydrogen, and alkyl groups having from 1–4 carbon atoms.

4,547,575
VAT DYES OBTAINABLE BY BROMINATION OF DIBENZANTHRONE AND REACTION WITH 1-AMINOANTHRAQUINONE

Athanassios Tzikas, Pratteln, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 17, 1983, Ser. No. 467,541

Claims priority, application Switzerland, Feb. 24, 1982, 1133/82

Int. Cl.[4] C07D *221/18, 221/22*

U.S. Cl. 546—30 8 Claims

1. A process for the preparation of a vat dye which is a reaction product of brominated dibenzanthrone with 1-aminoanthraquinone, which process comprises brominating dibenzanthrone with bromine in 80–100% sulfuric acid and in the presence of a bromination catalyst to a bromine content of 24 to 32%, and reacting the bromination product with 1.5 to 2.0 moles of 1-aminoanthraquinone per mole of brominated dibenzanthrone.

4,547,576
TETRAHYDROCARBAZOLE DERIVATIVES

Hans-Heinrich Hausberg, Ober-Ramstadt; Henning Böttcher, Darmstadt; Rudolf Gottschlich, Reinheim; Christoph Seyfried, Seeheim-Jugenheim, and Klaus-Otto Minck, Ober-Ramstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Fed. Rep. of Germany

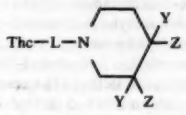
Filed Jan. 4, 1984, Ser. No. 568,310

Claims priority, application Fed. Rep. of Germany, Jan. 4, 1983, 3300094; Oct. 8, 1983, 3336643

Int. Cl.[4] C07D *401/06*

U.S. Cl. 546—197 1 Claim

1. A tetrahydrocarbazole derivative of the formula



wherein

L is —CO— or —CH_2CO—;

Thc is 1,2,3,4-tetrahydro-3-carbazolyl, 1,2,3,4-tetrahydro-3-carbazolyl substituted once or twice by alkyl, O-alkyl, S-alkyl, SO-alkyl, SO_2-alkyl, OH, F, Cl, Br, CF_3 or CN or by a methylenedioxy group;

the two radicals Y are each H or together form a C—C bond; and

one radical Z is Ar and the other radical Z is H.

4,547,577
PREPARATION OF (TRIFLUOROMETHYL)PYRIDINES

Janice E. Gatlin, Antioch; Mark A. VanDort, Pleasant Hill, both of Calif., and Curtis L. Volkmann, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jun. 8, 1984, Ser. No. 618,806

Int. Cl.[4] C07D *213/26*

U.S. Cl. 546—345 7 Claims

1. A process for preparing 3-chloro2-fluoro-5-(trifluoromethyl)pyridine which comprises contacting 2,3-dichloro-5-trichloromethylpyridine in liquid phase with at least a stoichiometric amount of anhydrous hydrogen fluoride at a temperature of 170° to 200° C. and a pressure of at least 200 psig in the absence of a catalyst.

4,547,578
PROCESS FOR REMOVING NAPHTHOQUINONE FROM PHTHALIC ANHYDRIDE PRODUCED THROUGH AIR OXIDATION OF NAPHTHALENE

Fritz Gude, Herne, and Herbert Haferkorn, Bottrop, both of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Feb. 24, 1984, Ser. No. 583,230

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1983, 3309310; Aug. 11, 1983, 3329026

Int. Cl.[4] C07D *307/89*

U.S. Cl. 549—250 9 Claims

1. A process for the substantial removal of naphthoquinone impurities from crude phthalic anhydride, comprising:

treating a crude phthalic anhydride containing naphthoquinone and other impurities at an elevated temperature with a polymerized 1,3-diene oil selected from the group consisting of polybutadiene, polydimethylbutadiene, poly-1,3-pentadiene, polyisoprene, polypiperylene and mixtures thereof, said polymerized 1,3-diene oil having a molecular weight within the range of about 800 to about 5,000, in an amount sufficient to reduce the content of naphthoquinone to less than 5 ppm.

4,547,579

SUBSTITUTED BENZOPYRAN COMPOUNDS

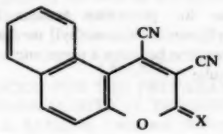
Peter Möckli, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 949,939, Oct. 10, 1978,. This application Sep. 30, 1982, Ser. No. 430,416

Int. Cl.⁴ C07D *311/92*

U.S. Cl. 549—280 **2 Claims**

1. A compound of the formula



in which

X is =NH or =O.

4,547,580

DIOXANE COMPOUNDS AND THEIR USE AS INSOLUBILIZERS FOR BINDERS FOR PAPER COATING COMPOSITIONS

William C. Floyd, Chester, S.C., assignor to Sun Chemical Corporation, New York, N.Y.

Division of Ser. No. 500,283, Jun. 1, 1983,. This application Nov. 2, 1984, Ser. No. 667,717

Int. Cl.⁴ C07D *319/12*

U.S. Cl. 549—379 **4 Claims**

1. A hemiacetal product of the reaction of glyoxal and a polyol that is selected from the group consisting of maleic acid mono(2,3-dihydroxy-1,4-dioxane-5-methylene ester); the metal alkali salt of maleic acid mono(2,3-dihydroxy-1,4-dioxane-5-methylene ester); and a mixture of 1,2,5,6-di(dihydroxydioxano)-3,4-dihydroxyhexane and 1,2,4,5-di(dihydroxydioxano)-3,6-dihydroxyhexane.

4,547,581

PYRIMIDO-2-BENZAZEPINES AND INTERMEDIATES IN THEIR PREPARATION

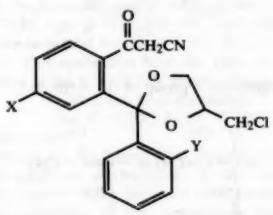
Rodney I. Fryer, North Caldwell; Norman W. Gilman, Wayne; Eugene J. Trybulski, Parsippany, and Armin Walser, West Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 437,047, Oct. 27, 1982, Pat. No. 4,481,142, which is a continuation of Ser. No. 151,025, May 19, 1980, abandoned, which is a continuation-in-part of Ser. No. 16,709, Mar. 1, 1979, abandoned. This application Aug. 23, 1984, Ser. No. 643,563

Int. Cl.⁴ C07D *317/00*

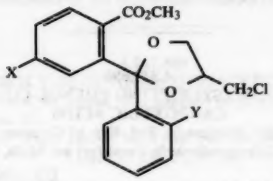
U.S. Cl. 549—451 **3 Claims**

1. The compound of the formula



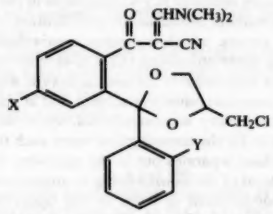
wherein X is selected from the group consisting of hydrogen, halogen, trifluoromethyl, ethyl, α-hydroxy ethyl and acetyl and Y is hydrogen or halogen.

2. The compound of the formula



wherein X is selected from the group consisting of hydrogen, halogen, trifluoromethyl, ethyl, α-hydroxy ethyl and acetyl and Y is hydrogen or halogen.

3. The compound of the formula



wherein X is selected from the group consisting of hydrogen, halogen, trifluoromethyl, ethyl, α-hydroxy ethyl and acetyl and Y is hydrogen or halogen.

4,547,582

METHOD OF PRODUCING HERBICIDE INTERMEDIATES

Peter K. Wehrenberg, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 5, 1984, Ser. No. 658,013

Int. Cl.⁴ C07C *69/76*

U.S. Cl. 560—060 **9 Claims**

1. A process of producing alkyl 3-hydroxy-4-(4-hydroxyphenoxy)-pentanoate which comprises the steps of:

(a) reacting 4-benzyloxyphenol with an alkali hydroxide and 2-chloropropionic acid in the presence of a suitable solvent and at a temperature sufficient to cause formation of 2-(4-benzyloxyphenoxy)-propionic acid;

(b) reacting said 2-(4-benzyloxyphenoxy)propionic acid with a compound selected from phosgene, oxalyl chloride, thionyl chloride, or phosphorus trichloride, in the presence of a suitable catalyst and solvent and at a temperature sufficient to cause formation of 2-(4-benzyloxyphenoxy)-propionyl chloride;

(c) reacting said 2-(4-benzyloxyphenoxy)propionyl chloride with 2,2-dimethyl-1,3-dioxan-4,6-dione and pyridine, all in the presence of a suitable solvent and at a temperature sufficient to cause formation of 5-[2-(4-benzyloxyphenoxy)propionyl]-2,2-dimethyl-1,3-dioxan-4,6-dione;

(d) reacting said 5-[2-(4-benzyloxyphenoxy)propionyl]-2,2-dimethyl-1,3-dioxan-4,6-dione with an alkyl alcohol for a period of time and at a temperature sufficient to cause formation of alkyl 4-(4-benzyloxyphenoxy)-3-oxopentanoate;

(e) reacting said alkyl 4-(4-benzyloxyphenoxy)-3-oxopentanoate with sodium borohydride in the presence of a suitable solvent and at a temperature sufficient to cause formation of alkyl-4-[4-benzylphenoxy)-3-hydroxy-pentanoate; and

(f) reacting said alkyl 4-(4-benzyloxyphenoxy)-3-hydroxypentanoate with hydrogen in the presence of a suitable solvent, a suitable catalyst, and at a sufficient temperature

to form the desired product, alkyl 3-hydroxy-4-(4-hydroxyphenoxy)pentanoate.

4,547,583

PROCESS FOR ESTERIFYING PHENOL-CONTAINING CARBOXYLIC ACIDS

Hans J. Nestler, Königstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 3, 1984, Ser. No. 657,571

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1983, 3336199

Int. Cl.⁴ C07C *69/76*

U.S. Cl. 560—061 **4 Claims**

1. A process for esterifying carboxylic acids containing phenol groups by means of (C_1–C_3)-alcohols in the presence of acid catalysts without simultaneous esterification of the phenolic hydroxyl groups, which comprises continuously metering an excess of a water-containing (C_1–C_3)-alcohol into a boiling hot solution or suspension of the said carboxylic acid and of the catalyst in a non-water-miscible solvent and at the same time distilling off a ternary solvent/alcohol/water mixture via a water separator, (a) the metering rate being such that an aqueous bottom phase separates out in the receiving flask and (b) the water content of the alcohol being so apportioned as not to breach the bottom limit of 0.1% or the upper limit of 1% (based on the contents of the reaction vessel) at any time in the course of the reaction.

4,547,584

3-HYDROXY-4-METHOXYPHENYL BENZOATES

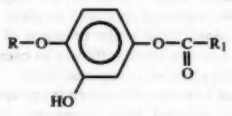
Jed A. Riemer, Scarsdale; Paul R. Zanno, Port Chester, and Ronald E. Barnett, Suffern, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 29, 1983, Ser. No. 566,648

Int. Cl.⁴ C07C *69/88*

U.S. Cl. 560—71 **7 Claims**

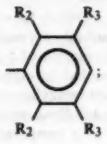
1. A compound of the formula:



wherein:

R is methyl;

R_1 is



each R_2 is selected from the group consisting of H, OH, CH_3, CH_2CH_3, OCH_3, CH_2OH, $CH_2CH_2CH_3$, $CH(CH_3)_2$, OCH_2CH_3, CH_2OCH_3, CH_2CH_2OH, $COCH_3$, $COCH_2CH_3$, CH_2COCH_3, COOH and $COOCH_3$; and

each R_3 is selected from the group consisting of H, CH_3, CH_2CH_3, OCH_3;

with the proviso that R_1 contain no more than 12 carbon atoms; and salts thereof.

4,547,585

PROCESS FOR PREPARING TETRAKIS [3-(3,5-DIBUTYL-4-HYDROXYPHENYL)PROPIONYLOXYMETHYL] METHANE

Toru Yamanaka, Otake, and Tadatoshi Yoshimura, Iwakuni, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

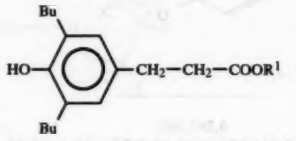
Filed May 25, 1982, Ser. No. 381,874

Claims priority, application Japan, May 28, 1981, 56-80123

Int. Cl.⁴ C07C *69/76*

U.S. Cl. 560—075 **9 Claims**

1. A process for preparing tetrakis [3-(3,5-dibutyl--4-hydroxyphenyl)propionyloxymethyl] methane, wherein an ester exchange reaction between a propionic acid ester having the general formula:



wherein Bu is an n-, sec-, iso-, or tert-butyl group and R^1 is an alkyl group having 1 to 4 carbon atoms, and pentaerythritol in the presence of an alkaline catalyst is effected by adding 0.2 through 1.8 mol of water based on 1 mol of the alkaline catalyst by the substantial completion of the ester exchange reaction.

4,547,586

PREPARATION OF 2-ISOPROPENYL-OR 2-ISOPROPYLIDENYL-3-HEXENOATES FROM CHRYSANTHEMIC ACID ESTERS

Gohfu Suzukamo; Mitsuhisa Tamura, both of Osaka, and Masami Fukao, Shiga, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

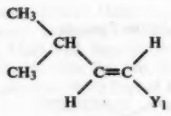
Division of Ser. No. 433,443, Oct. 8, 1982, Pat. No. 4,438,286. This application Dec. 5, 1983, Ser. No. 558,199

Claims priority, application Japan, Oct. 16, 1981, 56-166075; Oct. 16, 1981, 56-166076; Oct. 16, 1981, 56-166077; Oct. 16, 1981, 56-166078; Oct. 16, 1981, 56-166079

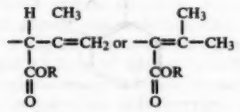
Int. Cl.⁴ C07C *67/30*

U.S. Cl. 560—211 **10 Claims**

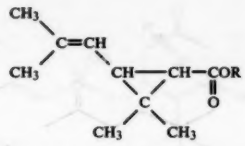
1. A process for the preparation of a substituted diene carboxylic acid ester having an E configuration represented by the formula:



wherein Y_1 represents a group of the formula



wherein R represents a lower alkyl group which comprises conducting the treatment of a chrysanthemic acid ester represented by the formula:



wherein R represents the same as that mentioned above, with sulfonic acid or sulfuric acid.

4,547,587

PROCESS FOR THE PREPARATION OF PHARMACEUTICAL BENZOIC ACID

Ludovicus A. L. Kleintjens, Stein, and Hubertus M. J. Grooten, Simpelveld, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Dec. 22, 1983, Ser. No. 564,199

Claims priority, application Netherlands, Jan. 3, 1983, 8300009

Int. Cl.⁴ C07C *51/42*

U.S. Cl. 562—494 **11 Claims**

1. In a process for the preparation of pharmaceutical benzoic acid by the oxidation of toluene in the presence of a molecular oxygen containing gas yielding a reaction product containing impurities, the improvement essentially comprising purifying said reaction product in liquid or finely divided solid form by contacting it with a gas phase essentially consisting of at least one gas having a critical temperature lower than 435 K., by passing said gas phase, in an amount of at least 1 m^3 (NTP) per kg benzoic acid, through said reaction product at a flow rate of at least 1 m^3 (NTP) gas per hour per kg benzoic acid, at a temperature within the range of between about 340 and 600 K. and at a pressure of at least 3 MPa, whereby at least a portion of said reaction product with impurities is taken into said gas phase, and subsequently selectively separating pharmaceutical benzoic acid from said gas phase by cooling said gas phase to a temperature of between about 315 and 370 K. at a pressure of between about 3 and 300 MPa.

4,547,588

PROCESS FOR PRODUCING METHACRYLIC ACID

Sargis Khoobiar, Kinnelon, N.J., assignor to The Halcon SD Group, Inc., New York, N.Y.

Division of Ser. No. 81,406, Oct. 3, 1979, Pat. No. 4,271,040, which is a continuation-in-part of Ser. No. 973,354, Dec. 26, 1978, Pat. No. 4,374,757, and a continuation-in-part of Ser. No. 972,745, Dec. 26, 1978, Pat. No. 4,252,682, and a continuation-in-part of Ser. No. 972,743, Dec. 26, 1978, Pat. No. 4,252,681, and a continuation-in-part of Ser. No. 973,495, Dec. 26, 1978, Pat. No. 4,252,683, and a continuation-in-part of Ser. No. 27,632, Apr. 6, 1979, Pat. No. 4,240,930, and a continuation-in-part of Ser. No. 27,633, Apr. 6, 1979, Pat. No. 4,261,858, and a continuation-in-part of Ser. No. 27,634, Apr. 6, 1979, Pat. No. 4,261,859, and a continuation-in-part of Ser. No. 27,635, Apr. 6, 1979, Pat. No. 4,261,860, and a continuation-in-part of Ser. No. 47,860, Jun. 12, 1979, Pat. No. 4,377,501. This application Mar. 30, 1981, Ser. No. 248,924

The portion of the term of this patent subsequent to Mar. 5, 2002, has been disclaimed.

Int. Cl.⁴ C07C *51/25, 57/055*

U.S. Cl. 562—535 **3 Claims**

1. A process for the preparation of methacrylic acid which comprises oxidizing methacrolein in the vapor-phase with molecular oxygen in the presence of a catalyst composition consisting essentially of the composition expressed by the formula:

$$Mo_{12}Cu_aP_bSb_cCs_dRe_eO_x$$

where: a=0.05–3; b=1–2; c=0.01–3; d=0.1–3; e=0.005–0.5; and x=a value determined by the valence and proportions of the other elements of the formula.

4,547,589

HYDROLYSIS OF NITRILOTRIACETONITRILE

Chung Y. Shen, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 3, 1984, Ser. No. 567,583

Int. Cl.⁴ C07C *101/20*

U.S. Cl. 562—572 **22 Claims**

1. A process for producing a nitrilotriacetate salt, comprising:

a. partially hydrolyzing a mixture of substantially stoichiometric amounts of nitrilotriacetonitrile and an alkali metal hydroxide in water at a temperature from about 25° C. to about 85° C.

b. boiling said partially hydrolyzed mixture for at least about 30 minutes;

c. adding at least about 0.04%, by weight of the mixture, of a bleaching agent which is non-reactive with the nitrilotriacetate salt product; and

d. recovering a product

4,547,590

CARBON MONOXIDE PROCESS FOR THE PRODUCTION OF ALPHA AMINO ACIDS

Richard A. Love, Columbia, and Lee R. Zehner, Brookeville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Jul. 6, 1984, Ser. No. 628,634

Int. Cl.⁴ C07C *99/00*

U.S. Cl. 562—575 **9 Claims**

1. A method for the synthesis of glycine comprising:

(a) contacting in a reaction vessel:

(e) the condensation product of formaldehyde and ammonia or urea,

(ii) a Lewis acid solvent characterized in that it is capable of forming the carbonium ion of said condensation product, is capable of solvating said carbonium ion so that it is available for reaction, and can be readily removed from the alpha-amino acid product after the reaction is terminated, and (iii) carbon monoxide,

(b) forming an intermidate reaction product, and

(c) hydrolyzing said intermediate reaction product to yield a product comprising glycine.

4,547,591

PREPARATION OF LINEAR POLYETHYLENEPOLYAMINES WITH SILICA-ALUMINA CATALYSTS

Michael E. Brennan; James H. Templeton, and Ernest L. Yeakey, all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 16, 1983, Ser. No. 562,122

Int. Cl.⁴ C07C *85/06*

U.S. Cl. 564—479 **4 Claims**

1. A method of preparing predominantly linear polyethylenepolyamines from ethyleneamines and alkanolamines, which comprises:

mixing and reacting about one-half mole to about five moles of ethyleneamine per mole of alkanolamine with an alkanolamine at a temperature of about 250° C. to about 400° C. and a pressure of about 500 to about 5000 psig in the presence of about 0.01 to about 20.0 weight percent of a silica-alumina catalyst and about 0.1 to about 3.0 weight percent of a phosphorus acid co-catalyst; and

recovering a polyethylenepolyamine product characterized by a relatively large percentage of linear, noncyclic polyethylenepolyamines.

4,547,592

THERMOSETTING ARYLETHER COMPOUNDS AND THEIR SYNTHESIS

Bruce A. Reinhardt, New Carlisle; Fred E. Arnold, Centerville, and Marilyn R. Unroe, Dayton, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 25, 1984, Ser. No. 634,346
Int. Cl.[4] C07C *147/06, 43/285, 43/29*
U.S. Cl. 568—33 **3 Claims**

1. The compound 4,4'-bis(3-phenylethynylphenoxy)diphenylsulfone.

2. The compound 2,2-bis[([([3-phenoxy]-3-phenoxy)-3-phenylethynyl]-3-phenoxy)-4-phenyl]-propane.

3. The compound 2,2-bis[([([3-phenoxy]-3-phenoxy)-3-phenylethynyl]-3-phenoxy)-4-phenyl]-hexafluoropropane.

4,547,593

PREPARATION OF (HYDROCARBYLTHIO)PHENOLS

Paul F. Ranken, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 26, 1984, Ser. No. 593,562
Int. Cl.[4] C07C *149/36*
U.S. Cl. 568—54 **8 Claims**

1. A process which comprises heating one or more (hydrocarbylthio)phenols selected from 2-, 3-, 4-, and poly(hydrocarbylthio)phenols wherein the hydrocarbylthio groups are alkylthio, cycloalkylthio, or arylthio groups at a temperature of about 100°–300° C. in the presence of a catalytic amount of an aluminum phenoxide as the sole catalyst so as to redistribute the hydrocarbylthio groups on the phenolic substrate of the (hydrocarbylthio)phenol starting material.

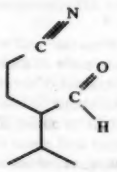
4,547,594

PROCESS FOR PRODUCING SOLANONE, NORSOLANADIONE AND INTERMEDIATES THEREFOR

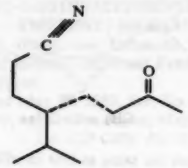
Kenneth K. Light, North Ogden, Utah; William L. Schreiber, Jackson; Joseph A. McGhie, Montclair, both of N.J.; Ronald P. Schreck, Old Bridge; Takao Yoshida, West Long Branch, both of N.J.; Loren B. Schreiber, Aberdeen, and Ranya Muralidhara, Fair Haven, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 511,944, Jul. 8, 1983, Pat. No. 4,489,009, which is a division of Ser. No. 357,158, Mar. 11, 1982, Pat. No. 4,412,083. This application Jul. 31, 1984, Ser. No. 636,283
Int. Cl.[4] C07C *45/63*
U.S. Cl. 568—392 **1 Claim**

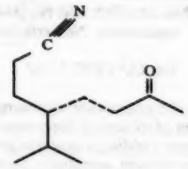
1. A process for preparing solanone comprising the steps of reacting acetone with an aldehyde having the structure:



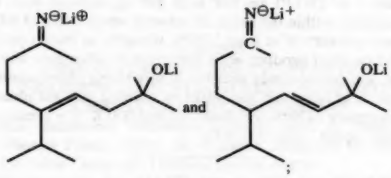
whereby at least one compound defined according to the structure:



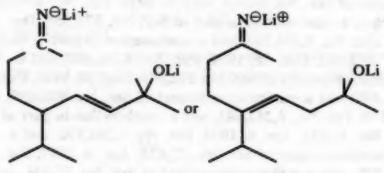
is formed, said reaction being carried out in the presence of base, wherein one of the dashed lines is a carbon-carbon double bond and the other of the dashed lines is a carbon-carbon single bond; reacting at least one compound defined according to the structure:



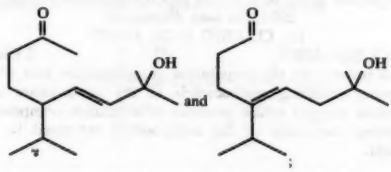
with methyl lithium in order to form at least one compound selected from the group consisting of:



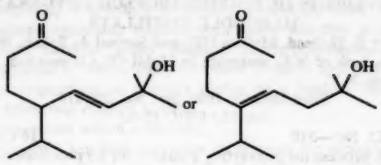
reacting at least one of the compounds having the structures:



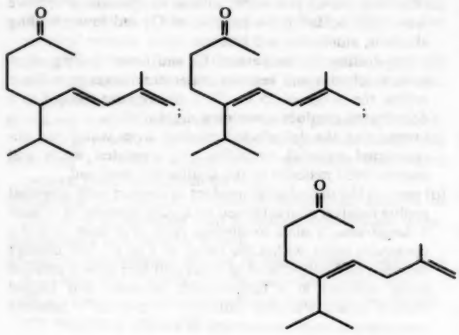
with aqueous acid in order to form at least one compound having a structure selected from the group consisting of:



and dehydrating at least one of the compounds having the structure:



in order to form at least one compound having a structure selected from the group consisting of:



4,547,595

METHOD OF REACTIVATING GROUP VIII ANIONIC HYDROFORMYLATION CATALYSTS

Biau-Hung Chang, Worthington, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 414,565, Oct. 2, 1982, and a continuation-in-part of Ser. No. 414,382, Oct. 2, 1982, said Ser. No. 414,565, is a continuation-in-part of Ser. No. 332,558, Dec. 21, 1981,. This application Apr. 16, 1984, Ser. No. 600,437

Int. Cl.[4] C07C *45/50*

U.S. Cl. 568—454 16 Claims

1. The method of reactivating an anionic Group VIII hydroformylation catalyst wherein said catalyst has the following general formula:

$$M^{+n}[H_yA_xL_z]^{-n}$$

wherein

A represents a metal selected from the group consisting essentially of Fe, Ru and Os;

n represents an integer greater than or equal to 1;

M represents a cationic moiety;

y represents an integer greater than or equal to 0;

x represents an integer greater than or equal to 1;

L is a ligand; and

z is an integer less than or equal to the available coordination bonding sites of A;

said method comprising reducing said deactivated catalyst by contacting said catalyst with a reducing agent strong enough to reduce said hydroformylation catalyst.

4,547,596

SEPARATION AND RECOVERY OF ALKYLATED PHENOLS

Ashok K. Mendiratta, Schenectady, and John J. Talley, Clifton Park, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 480,561, Mar. 30, 1983, abandoned. This application Oct. 30, 1984, Ser. No. 666,400

Int. Cl.[4] C07C *37/72, 37/70*

U.S. Cl. 568—751 8 Claims

1. A method of recovering one or more alkylated phenols from a basic aqueous solution containing the water-soluble salt of said alkylated phenols, said method comprising:

(a) contacting said basic aqueous solution with a water-immiscible organic solvent in which said alkylated phenols are soluble and

(b) separating said water-immiscible organic solvent from said basic aqueous solution;

said organic solvent being selected from the group consisting of

aliphatic esters of from 4 to 13 carbon atoms having no polar end groups,

straight chained monohydroxy aliphatic alcohols of from 4 to 13 carbon atoms,

branched chained monohydroxy aliphatic alcohols of from 5 to 13 carbon atoms having a chain length of at least 4 carbon atoms and cyclic alcohol of 5 to 13 carbon atoms,

said alkylated phenols being selected from the group consisting of monomeric phenols having from 1 to 5 alkyl radicals of from 1 to 4 carbon atoms with up to 12 carbon atoms for the complete molecule, and

bisphenols having from 1 to 10 alkyl radicals of from 1 to 4 carbon atoms with up to 24 carbon atoms for the complete molecule.

4,547,597

PREPARATION OF HALOGENATED PHENOLS

David H. Louks, Saginaw; Leonard R. Thompson, and Wayne C. Muench, both of Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 17, 1983, Ser. No. 495,382

Int. Cl.[4] C07C *39/24*

U.S. Cl. 568—779 14 Claims

1. A process for halogenating phenolic compounds comprising:

(1) forming a low melting point complex of the phenolic compounds; and

(2) contacting the low melting point complex of the phenolic compound in the molten state with a halogenating agent under halogenating conditions such that the halogenated phenolic compound is produced.

4,547,598

COBALT BORATE CATALYZED DECOMPOSITION OF ORGANIC HYDROPEROXIDES

John R. Sanderson, Austin; Kenneth P. Keating, Georgetown; Edward T. Marquis, Austin, and Steven H. Vanderpool, New Braunfels, all of Tex., assignors to Texaco, Inc., White Plains, N.Y.

Filed Dec. 20, 1984, Ser. No. 684,216

Int. Cl.[4] C07C *29/88*

U.S. Cl. 568—922 9 Claims

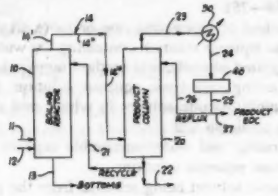
6. A method for the decomposition of t-butyl hydroperoxide in a solution with t-butyl alcohol which comprises contacting a liquid solution containing t-butyl hydroperoxide and t-butyl alcohol with an insoluble catalyst selected from the group consisting of cobalt borate alone and cobalt borate on a titanium dioxide support, at a temperature in the range of 80° to 120° C. to give an effluent substantially free of t-butyl hydroperoxide.

4,547,599

PROCESS FOR SCAVENGING FREE CHLORINE IN AN ETHYLENE DICHLORIDE STREAM

Wolfgang Schneider, Broadview Heights, and John P. Lenczyk, Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 27, 1984, Ser. No. 604,565
Int. Cl.[4] C07C *17/06*
U.S. Cl. 570—241 4 Claims



1. In a method for producing essentially pure ethylene dichloride by the direct chlorination of ethylene in the presence of a ferric chloride catalyst in which method effluent from the reactor consists essentially of contaminated ethylene dichloride with contaminant amounts of chlorine, ethylene, oxygen and polychlorinated compounds each of said amounts being less than 0.5% by weight of the combined material flowed to said reactor, the improvement comprising,

(a) maintaining a contaminant amount of chlorine in said contaminated ethylene dichloride in the range from about 100 ppm to about 0.5%; ethylene in the range from about 500 ppm to about 1.0%; said polychlorinated compounds in the range from about 50 ppm to about 0.1%; and oxygen in the range from about 0.1% to about 5% by weight based on the weight of the combined material flowed through said reactor, a temperature of reaction in the range from about 30° C. to about 120° C. and a pressure in the range from about 1 atm to about 5 atm; and,

(b) exposing said contaminated ethylene dichloride to ultraviolet light having a wavelength less than about 4000 Å and a major portion in the range from about 2500 Å to about 4000 Å, to catalyze the reaction of chlorine with ethylene dichloride to form 1,1,2-trichloroethane in from about 1 min to about 40 min;

whereby said amount of chlorine after irradiation of said contaminated ethylene dichloride is present in the range from about 1 ppm to about 20 ppm.

4,547,600

PROCESS FOR SELECTIVELY HYDROGENATING ACETYLENIC HYDROCARBONS OF A C_4 HYDROCARBON CUT CONTAINING BUTADIENE

Jean Cosyns, Maule, and Jean-Paul Boitiaux, Paris, both of France, assignors to Societe Francaise des Produits pour Catalyse Pro-Catalyse, Rueil-Malmaison, France

Filed Nov. 23, 1983, Ser. No. 554,653
Claims priority, application France, Nov. 24, 1982, 82 19835
Int. Cl.[4] C07C *5/02*
U.S. Cl. 585—259 8 Claims

1. In a process for the selective catalytic hydrogenation of the acetylenic hydrocarbons of a C_4 hydrocarbon cut containing a substantial quantity of butadiene and at least 1% by weight of acetylenic hydrocarbons, without substantial hydrogenation of butadiene, wherein said hydrocarbon cut in the liquid phase and hydrogen are contacted with a supported catalyst under hydrogenation conditions selective for hydrogenating said acetylenic hydrocarbons without substantial hydrogenation of butadiene, the improvement wherein said supported catalyst consists essentially of a carrier, 0.05 to 0.5% by weight of palladium and 0.05 to 1% by weight of silver, with the further provision that the Ag/Pd ratio by weight is at least 0.7, thus increasing the life of the selectivity of the catalyst.

4,547,601

CONVERSION OF FISCHER-TROPSCH OXYGENATES TO MIDDLE DISTILLATE

Robert E. Holland, Mullica Hill, and Samuel A. Tabak, Wenonah, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 23, 1980, Ser. No. 219,475
Int. Cl.[4] C07C *15/02*
U.S. Cl. 585—310 16 Claims

1. A process for converting a mixture of C_2 plus water soluble oxygenates comprising primarily a mixture of C_5 and lower boiling alcohols, aldehydes, ketones and water to a product containing a major proportion of middle distillate which comprises:

(a) distilling the C_2 plus water soluble oxygenates to remove water and acids from a mixture of C_5 and lower boiling alcohols, aldehydes and ketones;

(b) dehydrating the mixture of C_5 and lower boiling alcohols, aldehydes and ketones under conditions to achieve within the range of 25 to 100% conversion thereof to a dehydrated product containing eight olefins,

(c) separating the dehydrated product from water and unconverted material, recycling the separated water and unconverted material to the distillation step; and,

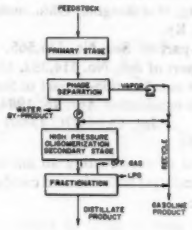
(d) passing the dehydrated product in contact with a special zeolite catalyst characterized by a pore opening of at least 5 Angstroms, a silica-to-alumina ratio of at least 12 and a constraint index within the range of 1 to 12, said contact between said dehydrated product and said zeolite catalyst being effected at a temperature, pressure and Liquid Hourly Space Velocity sufficient to provide a product containing a major proportion of middle distillate.

4,547,602

REACTOR SEQUENCING SYSTEM FOR CONVERTING OXYGENATES TO HYDROCARBONS

Samuel A. Tabak, Wenonah, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 548,377, Nov. 3, 1983, Pat. No. 4,482,772, and Ser. No. 526,852, Aug. 26, 1983, Pat. No. 4,487,985. This application Aug. 28, 1984, Ser. No. 645,137
The portion of the term of this patent subsequent to Nov. 13, 2001, has been disclaimed.
Int. Cl.[4] C07C *5/00, 1/00*
U.S. Cl. 585—314 11 Claims



1. In an integrated continuous process for converting oxygenated organic feedstock to liquid hydrocarbons including the steps of

(a) contacting feedstock with at least one primary stage fixed bed reactor containing acidic zeolite catalyst at elevated temperature and moderate pressure to convert at least a portion of the feedstock to hydrocarbons containing a major fracton of C_2–C_4 olefins;

(b) cooling and separating primary stage effluent to recover a light hydrocarbon vapor stream rich in C_2–C_4 olefins;

(c) pressurizing and heating at least a portion of the olefinic light hydrocarbon stream to form a secondary stage olefinic feedstream;

(d) contacting the olefinic feedstream in a secondary stage comprising a plurality of serially connected fixed bed reactors containing medium-pore shape selective acidic zeolite catalyst under oligomerization/polymerization conditions at substantially increased pressure and moderate temperature to convert olefins to a heavier liquid hydrocarbon effluent stream;

the improvement which comprises:

a cyclic fluid handling technique to connect the secondary stage serial reactors in operative fluid flow relationship whereby fresh or regenerated catalyst in a terminal reactor stage position receives effluent from at least one preceding secondary stage reactor operating at moderate temperature, said preceding secondary stage reactor containing catalyst of less activity than said catalyst in the terminal reactor stage position;

sequencing process flow to connect said preceding secondary stage reactor in said primary stage to receive said oxygenated feedstock;

increasing temperature in said previously preceding secondary stage reactor to primary stage temperature conditions;

removing a primary stage reactor containing inactivated catalyst from conversion service;

connecting the reactor containing inactivated catalyst in fluid flow relationship with a catalyst regeneration loop;

regenerating said catalyst in situ;

advancing the terminal reactor of the secondary stage to a preceding serial position in the secondary stage; and

adding a fresh or regenerated catalyst reactor in the secondary stage terminal position.

4,547,603

METHYLCYCLOPENTADIENE SYNTHESIS

Sundar J. Rajan, Ferndale, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Apr. 23, 1982, Ser. No. 371,286

Int. Cl.⁴ C07C *5/40*

U.S. Cl. 585—375 **17 Claims**

1. A process for limiting the formation of di- and polyalkylcyclopentadiene by-products in the synthesis of monoalkylcyclopentadiene, said process comprising the steps of:

(a) complexing cyclopentadiene monomer with sodium;

(b) reacting an alkylating agent with the cyclopentadiene sodium complex so formed, in the presence of a large stoichiometric excess of cyclopentadiene monomer to form the corresponding monoalkylcyclopentadiene, and

(c) recovering the monoalkylcyclopentadiene.

4,547,604

SELECTIVE ISOPROPYLATION OF CUMENE TO META-DIISOPROPYLBENZENE

George A. Olah, Beverly Hills, Calif., assignor to PCUK Produits Chimiques Ugine Kuhlmann, Courbevie, France

Continuation of Ser. No. 348,957, Feb. 16, 1982, abandoned, which is a continuation-in-part of Ser. No. 211,773, Dec. 1, 1980, abandoned, which is a division of Ser. No. 130,401, Mar. 14, 1980, abandoned. This application Feb. 6, 1984, Ser. No. 576,803

Int. Cl.⁴ C07C *2/66, 2/68, 2/70*

U.S. Cl. 585—458 **8 Claims**

1. A process for preparing a substantially pure meta-diisopropyl benzene isomer which comprises alkylating cumene with a propyl alkylating agent in the presence of hydrogen fluoride and a Lewis acid fluoride catalyst at reaction temperatures between about −20° and 0° C. to produce said meta-diisopropyl benzene isomer.

4,547,605

CATALYST FOR ALKYLATION OF AROMATIC HYDROCARBONS

Charles T. Kresge, Sewell; John P. McWilliams, Woodbury, both of N.J.; James C. Vartuli, West Chester, Pa., and Michael P. Nicoletti, Turnersville, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 28, 1983, Ser. No. 536,469

Int. Cl.⁴ C07C *2/68*

U.S. Cl. 585—467 **9 Claims**

1. A process for effecting alkylation of an aromatic-containing hydrocarbon charge in a reaction zone which comprises contacting said charge with an alkylating agent under conditions effective for accomplishing said alkylation in the presence of ZSM-23 zeolite catalyst whose pores are substantially unobstructed by silica.

4,547,606

SELECTIVE ISOMERIZATION OF DI-ISOPROPYL BENZENE TO META-DI-ISOPROPYL BENZENE

George A. Olah, Beverly Hills, Calif., assignor to PCUK Produits Chimiques Ugine Kuhlmann, Courbevie, France

Continuation of Ser. No. 348,956, Feb. 16, 1982, abandoned, which is a continuation-in-part of Ser. No. 211,775, Dec. 1, 1980, abandoned, which is a division of Ser. No. 130,401, Mar. 14, 1980, abandoned. This application Feb. 6, 1984, Ser. No. 576,802

Int. Cl.⁴ C07C *5/22*

U.S. Cl. 585—477 **13 Claims**

1. A process for producing a substantially pure meta-diisopropyl benzene isomer which comprises reacting a mixture of diisopropyl benzene isomers said mixture being other than a substantially pure meta-diisopropyl benzene isomer with anhydrous hydrogen fluoride in the presence of a Lewis acid fluoride catalyst at a temperature between about −50° and 200° C. to produce said meta-diisopropyl benzene isomer.

4,547,607

METHANE CONVERSION PROCESS

C. Andrew Jones, Newtown Square; John J. Leonard, Springfield, and John A. Sofranko, Malvern, all of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 522,925, Aug. 12, 1983, Pat. No. 4,443,649, Ser. No. 522,944, Aug. 12, 1983, Pat. No. 4,444,984, Ser. No. 522,942, Aug. 12, 1983, Pat. No. 4,443,648, Ser. No. 522,905, Aug. 12, 1983, Pat. No. 4,443,645, Ser. No. 522,877, Aug. 12, 1983, Pat. No. 4,443,647, Ser. No. 522,876, Aug. 12, 1983, Pat. No. 4,443,644, Ser. No. 522,906, Aug. 12, 1983, Pat. No. 4,443,646, Ser. No. 522,935, Aug. 12, 1983, and Ser. No. 522,938, Aug. 12, 1983, which is a continuation-in-part of Ser. No. 412,650, Aug. 30, 1982, abandoned, said Ser. No. 522,925, is a continuation-in-part of Ser. No. 412,667, Aug. 30, 1982, abandoned, said Ser. No. 522,944, is a continuation-in-part of Ser. No. 412,655, Aug. 30, 1982, abandoned, said Ser. No. 522,942, is a continuation-in-part of Ser. No. 412,662, Aug. 30, 1982, abandoned, said Ser. No. 522,905, is a continuation-in-part of Ser. No. 412,663, Aug. 30, 1982, abandoned, said Ser. No. 522,877, is a continuation-in-part of Ser. No. 412,664, Aug. 30, 1982, abandoned, said Ser. No. 522,876, is a continuation-in-part of Ser. No. 412,665, Aug. 30, 1982, abandoned, said Ser. No. 522,906, is a continuation-in-part of Ser. No. 412,666, Aug. 30, 1982, abandoned, said Ser. No. 522,935, is a continuation-in-part of Ser. No. 412,649, Aug. 30, 1982, abandoned. This application Apr. 16, 1984, Ser. No. 600,878

Int. Cl.⁴ C07C *2/00*

U.S. Cl. 585—500 **8 Claims**

1. In a method for converting methane to higher hydrocarbon products which comprises contacting a gas comprising methane in a methane conversion zone with a solid comprising at least one reducible oxide of at least one metal which oxide(s) when contacted with methane at temperatures selected within the range of about 500° to 1000° C. are reduced and produce higher hydrocarbon products and water, the improvement

which comprises recycling C_2+ alkanes recovered during subsequent processing of the effluent produced by said contacting to said methane conversion zone.

4,547,608

METHANE CONVERSION USING A SILICA/MAGNESIA SUPPORT

Marvin F. L. Johnson, Homewood, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Apr. 16, 1984, Ser. No. 600,924

Int. Cl.[4] C07C *2/00*

U.S. Cl. 585—500 **11 Claims**

1. In an method for converting a gas comprising methane to higher hydrocarbons which comprises contacting said gas with a contact agent at conditions to convert said gas, said contact agent comprising:

(a) at least one metal, the oxide of which is reduced and produces higher hydrocarbons and water when contacted with methane at a selected temperature in the range of about 500° to about 1000° C.; and

(b) a support comprising at least two oxides, and

(c) an alkali metal, the improvement which comprises employing said contact agent wherein said support further comprises a first and a second oxide, said first oxide

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4,547,609

MULTI-STAGE PROCESS FOR THE CONVERSION OF OLEFINS INTO HIGH VISCOSITY LUBRICANTS

Ralph M. Dessau, Middlesex, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 533,722, Sep. 19, 1983, abandoned. This application Feb. 11, 1985, Ser. No. 700,364

Int. Cl.[4] C07C *2/02*

U.S. Cl. 585—517 **15 Claims**

1. A two-stage catalytic process for the conversion of olefinic components in a feedstock containing at least one C_2–C_6 olefin or mixtures thereof into high viscosity index lubricating oils; the improvement comprising a first catalytic stage wherein said C_2–C_6 olefins are converted under conversion conditions comprising temperature greater than 260° C. at elevated pressure in contact with a catalyst comprising one or more members of a class of crystalline zeolites characterized by a silica/alumina mole ratio of at least 12 and a Constraint Index within the range of about 1 to about 12 having a crystal size of greater than about 0.5 micron to gasoline and distillate liquids; and a second catalytic stage wherein the effluent from said first stage is converted in the presence of a crystalline aluminosilicate zeolite catalyst which may comprise substantially the same or different chemical elements within said class of zeolites as described above having crystal size of less than about 0.5 micron under milder conditions than those of said first stage at a temperature of about 100 to about 260° C. to yield lubricant range product having improved viscosity index characteristics.

4,547,610

METHANE CONVERSION

John A. Sofranko, Malvern, and Howard P. Withers, Jr., Douglassville, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 600,658, Apr. 16, 1984, abandoned. This application Nov. 8, 1984, Ser. No. 669,551

Int. Cl.[4] C07C *2/00*

U.S. Cl. 585—500 **9 Claims**

1. In a method for converting methane to higher hydrocarbon products wherein a gas comprising methane is contacted at a temperature selected within the range of 500° to 1000° C. with at least one reducible oxide of at least one metal which oxides when contacted with methane at said temperature are reduced and produce higher hydrocarbon products and water, the improvement which comprises performing said contact in the presence of a gas comprising at least one oxide of nitrogen.

4,547,611

METHANE CONVERSION

C. Andrew Jones, Newtown Square, and John A. Sofranko, Malvern, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 522,937, Aug. 12, 1983, Pat. No. 4,499,322, and a continuation-in-part of Ser. No. 522,936, Aug. 12, 1983, Pat. No. 4,495,374. This application Apr. 16, 1984, Ser. No. 600,654

The portion of the term of this patent subsequent to Jan. 22, 2002, has been disclaimed.

Int. Cl.[4] C07C *2/00*

U.S. Cl. 585—500 **25 Claims**

1. In an improved method for converting methane to higher hydrocarbon products which comprises contacting a gas comprising methane with a solid comprising at least one reducible oxide of at least one metal which oxide when contacted with methane at a temperature within the range of about 500° to 1000° C. is reduced and produces higher hydrocarbon products and water, the improvement which comprises conducting the contacting with a solid which further comprises:

(a) at least one promoter selected from the group consisting of alkali metals and compounds thereof and

(b) a support comprising at least one member of the group consisting of alkaline earth metals and compounds thereof.

4,547,612

PRODUCTION OF LUBRICANT AND/OR HEAVY DISTILLATE RANGE HYDROCARBONS BY LIGHT OLEFIN UPGRADING

Samuel A. Tabak, Wenonah, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sep. 25, 1984, Ser. No. 654,348

Int. Cl.[4] C07C *3/20*

U.S. Cl. 585—533 **12 Claims**

1. A continuous process for producing heavy hydrocarbons comprising lubricant or heavy distillate range compounds having a substantially linear molecular conformation from lower olefins, comprising:

contacting olefinic feedstock under oligomerization conditions at moderate reaction temperature and high pressure favorable to formation of high molecular weight aliphatic hydrocarbons with a shape selective medium pore acidic crystalline sillicate zeolite catalyst in a reaction zone maintained under low severity conditions to prevent excessive cracking;

recovering oligomerized hydrocarbon effluent containing high boiling hydrocarbon product and lower boiling olefinic components;

separating the high boiling product by partially fractionating the effluent in a continuous product fractionator including the step of heating a high boiling product liquid fraction at temperature substantially higher than the reaction temperature, thereby providing a vapor fraction rich in lower boiling olefinic components;

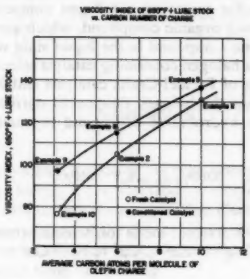
recycling a stream comprising at least a portion of the lower boiling fraction for further reaction in the reaction zone; said fraction containing the major portion of C_6 to C_{18} hydrocarbon components;

recovering a high boiling product stream comprising at least 90 weight percent hydrocarbons boiling above 290° C.

4,547,613
PROCESS FOR CONVERTING OLEFINS TO HIGH VISCOSITY INDEX LUBRICANTS

William E. Garwood, Haddenfield, and Hans J. Schoennagel, Lawrenceville both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 359,395, Mar. 18, 1982, abandoned. This application Jul. 10, 1984, Ser. No. 629,371
Int. Cl.[4] C07C *3/10, 3/20*
U.S. Cl. 585—533 14 Claims



1. A process of converting an olefinic stream containing light olefins having an average of 2 to 16 carbon atoms per molecule to a high viscosity index lube oil charge stock comprising:

(a) passing a light hydrocarbon gas of 3 to 6 carbon atoms per molecule over a ZSM-5 type catalyst to condition said catalyst at treating conditions of 0–100 psig, a temperature between about 400° F. and about 1000° F., and a weight hourly space velocity of between 0.1 and about 5;

(b) thereafter passing over said treated catalyst an olefin feedstock comprising olefins of an average number of carbon atoms per molecule of 2 to 16 at a pressure of 400–5000 psig, a temperature of 350° F. to 650° F., and a WHSV of 0.1–1.0;

(c) collecting the effluent stream therefrom; and

(d) fractionating said effluent stream into a high boiling point lube oil stock fraction, having a viscosity index greater than that produced by unconditioned fresh catalyst.

4,547,614
PROCESS FOR THE PREPARATION OF CONJUGATED DIENES BY DEHYDRATION OF ALDEHYDES

Atis Vavere, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 20, 1983, Ser. No. 534,023
Int. Cl.[4] C07C *1/20*
U.S. Cl. 585—606 6 Claims

1. In a process for the preparation of conjugated dienes by the dehydration of the corresponding aliphatic aldehyde in the presence of an acidic dehydration catalyst, the improvement comprising controlling the aldehyde reactant feed rate so that the aldehyde liquid hourly space velocity is less than about 1.0 hr^{-1}.

4,547,615
PROCESS FOR PRODUCING CONJUGATED DIOLEFINS

Haruhisa Yamamoto, Takaoka, Japan, assignor to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Jun. 8, 1984, Ser. No. 618,922
Claims priority, application Japan, Jun. 16, 1983, 58-108281; Oct. 26, 1983, 58-200624
Int. Cl.[4] C07C *5/48, 5/09*
U.S. Cl. 585—621 11 Claims

1. A process for producing a conjugated diolefin, which comprises oxidatively dehydrogenating a monolefin having at least 4 carbon atoms in the vapor phase with molecular oxygen to form the corresponding conjugated diolefin, said reaction being carried out in the presence of a catalyst having the general composition formula

$$Mo_aBi_bCr_cNi_dX_eFe_fY_gZ_hO_i$$

wherein X represents Zr or Al, Y represents at least one element selected from the group consisting of metal elements of Group Ia of the periodic table, metal elements of Group II of the periodic table, Tl and P, Z represents at least one element selected from the group consisting of In, Ag, Ti, Nb, Ta, Co, La, Ce, Nd and Mn, a, b, c, d, e, f, g, h and i are respectively the atomic numbers of Mo, Bi, Cr, Ni, X, Fe, Y, Z and O, and when a=12, b=0.05–20, c=0.05–20, d=0.1–30, e=0.01–20, f=0.01–20, g=0.001–20, h=0–20, and i is the atomic number of oxygen satisfying the atomic valences of the other elements.

4,547,616
CONVERSION OF OXYGENATES TO LOWER OLEFINS IN A TURBULENT FLUIDIZED CATALYST BED

Amos A. Avidan, Mantua; Ronald M. Gould, Sewell, and Steven E. Kane, Paulsboro, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 28, 1984, Ser. No. 687,045
Int. Cl.[4] C07C *1/20*
U.S. Cl. 585—640 9 Claims

1. A fluidized bed catalytic process for substantially complete conversion of feedstock consisting essentially of methanol and/or dimethylether to hydrocarbons rich in light olefins, comprising the steps of

maintaining a fluidized bed of zeolite catalyst particles in a turbulent reactor bed at a temperature of at least 475° C., said catalyst having an apparent particle density of about 0.9 to 1.6 g/cm^3 and a size range of about 1 to 150 microns, and average catalyst particle size of about 20 to 100 microns containing about 10 to 25 weight percent of fine particles having a particle size less than 32 microns;

passing hot feedstock vapor upwardly through the fluidized catalyst bed under turbulent flow conditions;

maintaining turbulent fluidized bed conditions through the reactor bed between transition velocity and transport velocity at a superficial fluid velocity of about 0.3 to 2 meters per second; and

recovering hydrocarbon product containing a major amount of olefins and having a molar ratio of C_3^+ olefins to ethene of at least 12:1.

4,547,617
OLEFIN CONVERSION

M. Bruce Welch, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 16, 1984, Ser. No. 580,591
Int. Cl.[4] C07C *6/00*
U.S. Cl. 585—646 8 Claims

1. A process for disproportionating and isomerizing olefins comprising contacting at least one feed olefin having at least three carbon atoms per molecule under suitable reaction conditions which convert the feed olefin into other olefins having different numbers of carbon atoms with a catalytically effective amount of a catalyst composition consisting essentially of silica and molybdenum oxide promoted with an effective promoting amount of a titaniferous agent.

4,547,618

MODIFIED ZSM-12 CATALYSTS AND PROCESSES FOR CONVERSION OF PROPANE TO PROPYLENE

Nancy P. Forbus, Newtown, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 28, 1984, Ser. No. 686,961
Int. Cl.[4] C07C 5/26, 5/40
U.S. Cl. 585—660 9 Claims

1. A process for converting propane to propylene, said process comprising contacting said propane under sufficient dehydrogenation conditions with a catalyst comprising ZSM-12, said catalyst further comprising:

(i) a magnesium and/or manganese modifier; and

(ii) a platinum modifier.

4,547,619

PROCESS FOR REMOVAL OF PHENOLIC INHIBITORS FROM POLYMERIZABLE CONJUGATED OLEFIN

Zaida Diaz, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 24, 1984, Ser. No. 685,665
Int. Cl.[4] C07C 7/12
U.S. Cl. 585—824 12 Claims

1. A process for the removal of phenolic polymerization inhibitors from an inhibitor-containing liquid conjugated olefin hydrocarbon which comprises contacting said liquid hydrocarbon with sorbent material comprising particulate acidified active carbon which sorbent has previously been oxidized by contact with a highly acidic oxidizing fluid and substantially separated from said oxidizing liquid.

4,547,620

PROCESS FOR REMOVING A HALOGEN COMPONENT DERIVED FROM A CATALYST FROM AN ORGANIC COMPOUND CONTAINING SAID HALOGEN COMPONENT

Shigeo Miyata, and Noriko Iizima, both of Takamatsu, Japan, assignors to Kyowa Chemical Industry Co. Ltd., Tokyo, Japan

Filed Feb. 24, 1984, Ser. No. 583,308
Claims priority, application Japan, Feb. 28, 1983, 58-30949
Int. Cl.[4] C07C 7/12
U.S. Cl. 585—852 14 Claims

1. A process for removing a halogen component from a halogen-containing organic compound, which comprises contacting an organic compound in the liquid state which is produced by using a halogen containing catalyst selected from the group consisting of Freidel-Crafts catalysts and Ziegler catalysts and contains the halogen conponent derived from said catalyst, with a hydrotalcite compound represented by the formula

$$M_{1-x}^{2+}M_x^{3+}(OH)_{2+x-ny}A_y^{n-}.mH_2O$$

wherein

M^{2+} represents a divalent metal ion selected from the group consisting of Mg^{2+}, Zn^{2+}, Ca^{2+}, $Ni^{2+}Co^{2+}$, Mn^{2+}, and Cu^{2+},

M^{3+} represents a trivalent metal ion selected from the group consisting of-Al^{3+}, Fe^{3+} and Cr^{3+},

A^{n-} represents an anion having a valence of n selected from the group consisting of HCO_3^-, OH^- and CO_3^{2-}, and

x,y and m are each a positive number and satisfy the following conditions

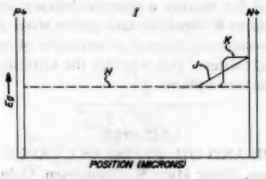
$0.1<x<0.5$, $0.1<y<0.4$, $1\leqq m<1$,

under non-aqueous conditions and at a temperature at which the halogen component which has been taken up by the hydrotalcite compound is not liberated, and separating the treated organic compound from the hydrotalcite compound.

4,547,621
STABLE PHOTOVOLTAIC DEVICES AND METHOD OF PRODUCING SAME

Michael Hack, Troy, and Subhendu Guha, Clawson, both of Mich., assignors to Sovonics Solar Systems, Solin, Ohio

Filed Jun. 25, 1984, Ser. No. 623,860
Int. Cl.[4] H01L *31/06*
U.S. Cl. 136—249 TJ **10 Claims**



1. A photovohaic device of the type comprising a semiconductor body having a first electrode in electrical communication with a first surface thereof, said first electrode forming the light incident surface of the device, and a second electrode in electrical communication with a second surface thereof, said semiconductor body comprising:

at least one triad of semiconductor layers including a layer of substantially intrinsic semiconductor material, a layer of p-type semiconductor material disposed in contact with a first surface of the intrinsic layer, and a layer of n-type semiconductor material disposed in contact with a second surface of the intrinsic layer, said layers cooperating to provide a photoactive region for absorbing photons of incident light and generating charge carrier pairs in response thereto;

the intrinsic layer of at least one of said triads including a wide band gap portion disposed proximate the light incident surface of the device, said wide gap portion (a) being less than one half the thickness of the remaining narrower gap portion of the intrinsic layer and (b) including at least one band gap broadening material not present in the narrower gap portion, whereby substantially uniform absorption of photons throughout at least a substantial portion of the bulk of the photoactive region is promoted, so as to generate electron hole pairs through said substantial portion and reduce charge carrier recombination therein, for providing a photovoltaic device exhibiting long term stability.

4,547,622
SOLAR CELLS AND PHOTODETECTORS

John C. C. Fan, Chestnut Hill, and Ronald P. Gale, Bedford, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

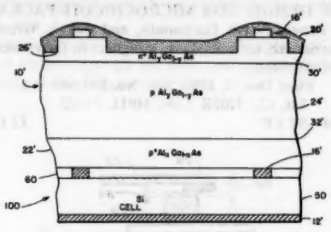
Filed Apr. 27, 1984, Ser. No. 604,922
Int. Cl.[4] H01L *31/06*
U.S. Cl. 136—249 **11 Claims**

1. A photovoltaic device with a back surface field (BSF) comprising:

(a) a BSL layer of p-doped direct bandgap semiconductor material;

(b) an active layer, formed on said BSL layer, of p-doped direct bandgap semiconductor material having an energy gap Eg less than that of the BSL layer and forming a heterojunction with said BSL layer;

(c) a shallow layer less than 0.15 μm in thickness of n-doped direct bandgap semiconductor material forming a charge separation junction with the active layer.

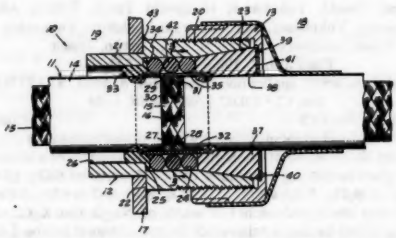


6. The device of claim 1 including a second cell affixed to the BSL layer to form a tandem cell structure.

4,547,623
CABLE SHIELD GROUNDING APPARATUS

Michael K. Van Brunt, Playa del Rey, and Peter Madle, Redondo Beach, both of Calif., assignors to Automation Industries, Inc., Greenwich, Conn.

Filed Oct. 7, 1983, Ser. No. 540,127
Int. Cl.[4] H02G *15/02*; H05K *9/00*
U.S. Cl. 174—35 R **8 Claims**



1. A device for establishing connection between electrical ground and a cable shield, comprising:

a cable having an external shield;

first and second hollow metallic cylindrical means received on the cable over the cable shield, said cylindrical means including threads for releasably joining said cylindrical means to one another;

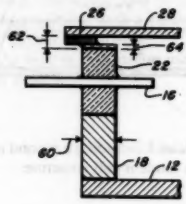
generally annular conductive means located about the cable shield and within at least one of the cylindrical means including first ring means with a bore enabling contacting receipt about the cable shield, an annular metal plate received about the first ring means, and second ring means received about said annular metal plate, said first and second ring means and annular metal plate being clampingly engaged by the threading of said first and second cylindrical means together to effect electrical contact between the cable shield and said first and second cylindrical means; and

means for conductively affixing one of the cylindrical means to electrical ground.

4,547,624
METHOD AND APPARATUS FOR REDUCING PACKAGE HEIGHT FOR MICROCIRCUIT PACKAGES

Steven A. Tower, North Dartmouth, and Jay S. Greenspan, South Dartmouth, both of Mass., assignors to Isotronics, Inc., New Bedford, Mass.

Filed Dec. 2, 1983, Ser. No. 557,640
Int. Cl.[4] H05K *5/04;* **H01L** *39/02*
U.S. Cl. 174—52 FP **12 Claims**



1. A method of minimizing package height for microcircuit packages comprising the steps of:

providing a flat pack frame having at least one wall carrying at least one feedthrough;

affixing an offset weld ring to the top surface of the flat pack frame, the weld ring extending past the wall of the flat pack frame carrying a feedthrough; and

welding a lid to the offset weld ring at the periphery of the weld ring, whereby the heat of welding is removed from the feedthrough such that the distance between the top of the feedthrough to the top surface of the frame can be minimized.

4,547,625
GLASS MULTILAYER WIRING BOARD AND METHOD FOR ITS MANUFACTURE

Hiromi Tosaki, Yokohama; Hirayoshi Tanei, Tokyo; Akira Ikegami, Yokohama, and Nobuyuki Sugishita, Yokosuka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 7, 1983, Ser. No. 511,482
Claims priority, application Japan, Jul. 8, 1982, 57-117765
Int. Cl.[4] C03C *3/08;* **H05K** *1/03*
U.S. Cl. 174—68.5 **13 Claims**

1. A sintered glass multilayer wiring board consisting essentially of 70–10 wt.% of silica glass and 30–90 wt.% of a borosilicate glass consisting essentially of 55–75 wt.% of SiO_2, 13–25 wt.% of B_2O_3, 5–13 wt.% of Al_2O_3, each 1–5 wt.% of PbO, MgO and BaO, and each 1–2 wt.% of Na_2O and K_2O, said wiring board having a relative dielectric constant below 5 and being sintered at a temperature of at most 900° C.

5. An improved method for making a glass multilayer wiring board in which a plural number of green sheets carrying each a wiring conductor are arranged to form a laminated assembly and the assembly is sintered, wherein the improvement comprises a sequence of the steps of making a green sheet from a mixture consisting essentially of silica glass powder and a borosilicate glass powder consisting essentially of 55–75 wt.% of SiO_2, 13–25 wt.% of B_2O_3, 5–13 wt.% of Al_2O_3, each 1–5 wt.% of PbO, MgO and BaO, and each 1–2 wt.% of Na_2O and K_2O, the silica glass content of said mixture being 10–70 wt.%; forming on said green sheet a conductor comprising a low-resistance conducting material; placing a number of green sheets carrying the conductor one over another to form a multilayer assembly; and sintering the multilayer assembly, said sintering the multilayer assembly performed at a temperature of at most 900° C., whereby a wiring board having a relative dielectric constant below 5 is formed while deformation of the conductor due to flow of glass during heat treatment is prevented.

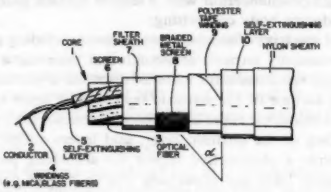
8. A method for forming a sintered glass multilayer wiring board comprising the steps of preparing a mixture consisting essentially of borosilicate glass powder and silica glass powder, said mixture being 70 to 10 wt% of silica glass and 30 to 90 wt% of borosilicate glass consisting essentially of 55–75 wt% of SiO_2, 13–25 wt% of B_2O_3, 5–13 wt% of Al_2O_3, each 1–5 wt% of PbO, MgO and BaO, and each 1–2 wt% of Na_2O and K_2O; forming the mixture into a green sheet; and sintering said green sheet at a temperature of at most 900° C. to form said board, whereby a wiring board having a relative dielectric constant below 5 is formed.

12. A method for making a glass multilayer wiring board according to claim 8, wherein said green sheet has formed thereon, prior to sintering thereof, a conductor of copper in the form of a wiring pattern, and wherein the sintering is carried out in a nitrogen atmosphere.

4,547,626
FIRE AND OIL RESISTANT CABLE

Jack R. Pedersen, Moss; Hans R. Thomassen, Oslo, and Svein Henriksen, Son, all of Norway, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 5, 1984, Ser. No. 617,415
Claims priority, application Norway, Aug. 25, 1983, 83305
Int. Cl.[4] H01B *7/28*
U.S. Cl. 174—107 **12 Claims**



1. A fire-resistant communication cable comprising:

a conductor;

a cover of an insulating material disposed on the outer surface of said conductor;

a layer of a self-extinguishing material disposed on the outer surface of said cover of insulating material;

a sheath of a material which is capable of releasing water of crystallization when subjected to at least a predetermined temperature and which is positioned on the outer surface of said layer of self-extinguishing material;

a metallic screen positioned on the outer surface of said sheath and including wires braided with respect to a plane perpendicular to the cable axis at an angle in the range between but excluding 35°–45° to reduce longitudial shrinkage of the screen upon an increase in cable diameter and to maintain integrity of said conductor; and

two outer protective covers located directly on the outer surface of said screen, said covers including a sheath of a self-extinguishing material.

4,547,627
TRANSFORMER BAR CONNECTOR AND PEDESTAL BAR CONNECTOR COVER

Eugene W. McGrane, Ormond Beach, Fla., assignor to Homac Mfg. Company, Ormond Beach, Fla.

Continuation-in-part of Ser. No. 515,237, Jul. 19, 1983, Pat. No. 4,513,169. This application Oct. 29, 1984, Ser. No. 665,890
Int. Cl.[4] H01R *13/44*
U.S. Cl. 174—138 F **2 Claims**

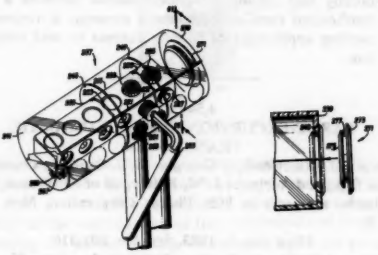
1. An insulator cover for an elongated pedestal bar connector having a plurality of spaced installation ports extending along the length thereof and extending therethrough at substantially right angles to the longitudinal axis of said pedestal bar connector, a plurality of internally threaded boreholes equal in number to said installation ports and extending from said ports to the exterior of said pedestal bar connector at

substantially right angles to the axes of said ports; said cover comprising

an elongated housing closed at one end and open at the other end;

a plurality of first and second substantially parallel rows of longitudinally aligned spaced access ports through the wall of said housing, said first row of access ports being peripherally spaced from said second row of access ports substantially ninety degrees;

the spacing between adjacent individual access ports being



substantially the same as the spacing between said installation ports in said pedestal bar connector;

at least one alignment rib secured to and extending transversely within the interior of said housing;

aperture means in said alignment rib of a dimension to allow longitudinal passage of said pedestal bar connector therethrough whereby said access ports will be aligned with said installation ports and boreholes in said pedestal bar connector when the cover is assembled thereon; and

removable cap means for covering the opening at said other end of said housing.

4,547,628

DATA TRANSMISSION SYSTEM

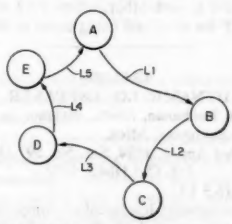
Yasuyuki Tamura, Kawasaki; Masaki Nakaoka, Yokohama; Ken Miyagi, Yokohama; Nao Nogashima, Yokohama; Yasuhiko Sue, Yokohama; Masashi Suda, Iruma, and Masao Ariga, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 473,647, Mar. 9, 1983, abandoned. This application Mar. 12, 1985, Ser. No. 710,529

Claims priority, application Japan, Mar. 15, 1982, 57-39378

Int. Cl.[4] **H04L** *3/00, 11/00*

U.S. Cl. 178—2 B **20 Claims**



6. A data transmission system for transmitting data through a data transmission line, comprising:

a first station for sending character code data onto the data transmission line;

a second station for sending the character code data onto the data transmission line, said second station being different from said first station;

a third station for receiving the character code data sent from said first and second stations through the data transmission line, and converting the received character code data to image data which is sent onto the data transmission line; and

a fourth station for receiving the image data sent from said third station through the data transmission line and processing the received image data.

4,547,629

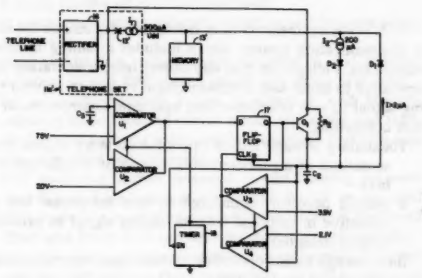
ENERGY MANAGEMENT CIRCUIT

Robert W. Corless, San Jose, Calif., assignor to Comdial Technology Corporation, Sunnyvale, Calif.

Filed Feb. 6, 1984, Ser. No. 577,105

Int. Cl.[4] **H04M** *19/00;* **H02J** *7/00*

U.S. Cl. 179—81 R **10 Claims**



4. In a telephone circuit including a electronic memory, a memory keep alive power source, comprising:

a large value capacitor for storing a keep alive power charge;

a trickle charge resistor coupled to a telephone line power source to provide a charging current top said capacitor;

a charge comparator coupled to said capacitor for generating a charge control signal output when said capacitor's charge is at less than a selected minimum voltage level within a charge range and for terminating said control signal when said capacitor's charge is at a selected operating voltage level within said charge range; and

a transistor switch, coupled to receive said control signal and responsive thereto to bypass said trickle charge resistor, such that said line power source is coupled directly to said capacitor when said capacitor's charge is at less than the selected minimum voltag level; and until said capacitor's charge is stored to said operating voltage level;

a line power source comparator coupled to said line power source is generating a charge inhibit signal when said line power source is at less than a selected minimum voltage level and when said line voltage is in excess of a selected maximum voltage level;

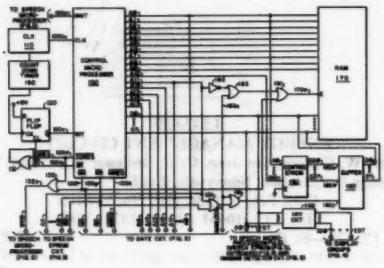
switch means, responsive to said charge inhibit signal, for inhibiting operation of said transistor switch during intervals when said line power voltage is above or below said selected minimum and maximum voltage levels; and

a sleep timer for periodically supplying operating power to said charge comparator, line power source comparator and switch means for a selected interval and for periodically withholding operating power from said circuit for a selected interval to reduce overall circuit power consumption.

4,547,630
SPEECH SYNTHESIZED TIME ANNOUNCEMENT CIRCUIT

David P. Giammarrusco, Bartlett, Ill., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Dec. 5, 1983, Ser. No. 558,061
Int. Cl.[4] H04M 3/50
U.S. Cl. 179—89 12 Claims



1. A voice synthesized time announcement circuit for use in a communication system which includes a calling telephone station and a telephone line, said calling telephone station being operative to cause said communication system to apply a ringing signal to said telephone line, said time announcement circuit comprising:

vocabulary storage means operative to store digital representations of a predetermined group of words and numbers;

a ringing detector, connected to said telephone line and operative in response to said ringing signal to provide a ringing detected signal;

time storage means operative to store data representative of the current time of day;

message storage means;

a first microprocessor connected to said ringing detector, said time storage means said message storage means and said vocabulary storage means, and periodically operative to update the data representative of the current time of day in said time storage means;

said first microprocessor being further operative in response to said ringing detected signal to retrieve, from said time storage means, the data representative of the current time of day; and further operative to retrieve, from said vocabulary storage means, selected ones of said digital words and selected ones of said digital numbers corresponding to the current time of day; further operative to concatenate said retrieved words and numbers into a digital time announcement message; and further operative to store said digital time announcement message in said message storage means;

a second microprocessor connected to said first microprocessor;

decoding means connected to said first microprocessor;

said first microprocessor being further operative to provide address signals representative of said second microprocessor, said ringing detector, and storage locations of said vocabulary storage means;

said decoding means being operative to provide corresponding enable signals for said second microprocessor, ringing detector and vocabulary storage means, respectively;

said first microprocessor being further operative to transmit said digital time announcement message to said second microprocessor;

said second microprocessor being operative to provide analog representations of said digital time announcement message;

an amplifier connected to said second microprocessor and operative to amplify said analog representations of said digital time announcement message; whereby said amplifier provides an analog time announcement message;

said first microprocessor being further operative to provide an address signal representative of a transformer circuit; said decoding means being operative in response to said transformer address signal to provide a transformer enable signal; said first microprocessor being further operative to provide a transformer connect signal; and

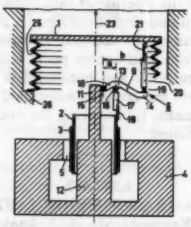
a transformer circuit connected between said amplifier and said telephone line and operative to couple said analog time announcement message onto said telephone line;

Whereby said calling telephone station receives a voice synthesized time announcement message in response to causing application of ringing current to said telephone line.

4,547,631
LARGE-EXCURSION ELECTROACOUSTIC TRANSDUCER

Joris A. M. Nieuwendijk; Georgius B. J. Sanders; Cornelis D. van Dijk, and Adrianus J. M. Kaizer, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 6, 1983, Ser. No. 501,310
Claims priority, application Netherlands, Jun. 23, 1982, 8202529
Int. Cl.[4] H04R 9/04
U.S. Cl. 179—115.5 R 22 Claims



1. An electroacoustic transducer comprising, a diaphragm, an electromechanical actuator, a lever mechanism coupling the electromechanical actuator to the diaphragm for transmitting motion from the electromechanical actuator to said diaphragm, characterized in that the lever mechanism comprises n lever devices with each lever device coupled between the actuator and the diaphragm, the lever devices being arranged at an angle relative to each other, where $n \geqq 2$, said angle being smaller than 180° for $n=2$ and being equal to $360°/n$ for $n \geqq 3$.

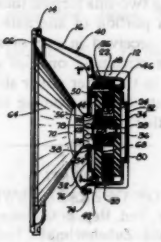
4,547,632
DYNAMIC LOUDSPEAKER

Michael Bryson, Buchanan, Mich., assignor to Electro-Voice, Incorporated, Buchanan, Mich.

Filed Apr. 4, 1984, Ser. No. 597,238
Int. Cl.[4] H04R 9/02
U.S. Cl. 179—115.5 VC 7 Claims

1. An electromagnetic loudspeaker comprising a frame, a magnetic structure mounted on the frame having a ferromagnetic plate with spaced parallel front and back surfaces, said plate having a cylindrical opening extending therethrough from the front to back surfaces thereof, and a ferromagnetic cylindrical center post of smaller diameter than the cylindrical opening disposed coaxially within the opening to form an annular gap between the center post and the plate, the magnetic structure producing a magnetic field with lines of force extending radially across the annular gap, a thin layer of Teflon disposed on and covering the entire surface of the cylindrical opening, a nonmagnetic electrically insulating cylindrical coil

form having an inner diameter greater than the diameter of the cylindrical post and an outer diameter less than the diameter of the plastic coating on the cylindrical opening, means for mounting the cylindrical coil form to the frame for translation



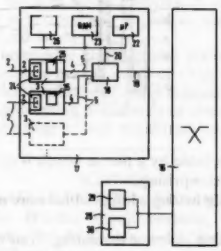
along its central axis, said mounting means suspending the cylindrical coil form coaxially with and confronting the cylindrical post, and a helical electrically conducting voice coil mounted on the outer surface of the cylindrical coil form and confronting the plastic coating on the opening in the plate.

4,547,633

METHOD OF AND CIRCUIT FOR LOCATING FAULTS IN A DIGITAL TELECOMMUNICATION SUBSCRIBER TERMINATION

Kálmán Széchényi, Spielberg, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 29, 1983, Ser. No. 555,903
Int. Cl.⁴ H04B *3/46*
U.S. Cl. 179—175.3 F **7 Claims**



4. A circuit for locating faults in a telecommunication subscriber termination comprising:

a network termination;

a subscriber's line connected to said network termination;

an echo canceller containing an adaptive digital filter capable of generating a continuous and automatic series of coefficients when a fault is detected, said echo canceller being connected to said subscriber's line;

a digital memory connected to said adaptive digital filter with capacity for storing coefficients from said digital filter determined during faultless operation of said subscriber's line and said network termination; and

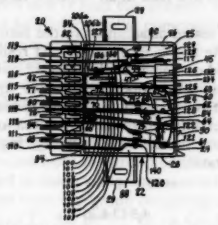
an evaluating circuit connected to said echo canceller and to said memory for comparing said coefficients stored in said memory with said continuous and automatic series of coefficients generated by said adaptive digital filter whereby whether a fault exists in the subscriber's line or in the network termination can be determined.

4,547,634

ELECTRICAL APPLIANCE INTERLOCK SWITCH WITH IMPROVED BUSS

Raymond A. Legér, Crystal Lake, Ill., assignor to Cherry Electrical Products Corporation, Waukegan, Ill.

Filed Jul. 12, 1983, Ser. No. 512,931
Int. Cl.⁴ H02B *1/08*
U.S. Cl. 200—50 C **6 Claims**



1. An interlock switch, comprising:

a housing having an interior front wall;

first conductive switch means mounted in said housing along said wall;

second conductive switch means mounted in said housing adjacent to said first switch means and along said wall;

third conductive switch means mounted in said housing adjacent to said second switch means and along said wall, so that said second switch means is disposed between said first and third switch means;

a first insulating barrier mounted in said housing between said first and said second conductive switch means, said first insulating barrier having a forward portion displaced from said front wall and defining a first gap therewith;

a second insulating barrier mounted in said housing between said second and said third conductive switch means, said second insulating barrier having a forward portion displaced from said front wall, and defining a second gap therewith; and

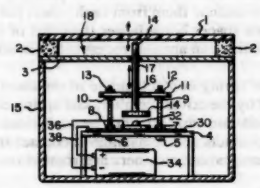
an electrically conducting buss, disposed within said first gap and said second gap, and electrically interconnecting said first conductive switch means and said third conductive switch means across said second conductive switch means without contacting said second conductive switch means.

4,547,635

SQUEEZE SWITCH PARTICULARLY ADAPTED FOR USE WITH STUFFED TOYS

Marc C. Segan; Sayre A. Swarztrauber, both of New York, and Neil K. Patterson, Brooklyn, all of N.Y., assignors to R. Dakin, South San Francisco, Calif.

Filed Jan. 16, 1984, Ser. No. 571,191
Int. Cl.⁴ H01H *35/00*
U.S. Cl. 200—52 R **14 Claims**



1. In a stuffed novelty item having an electrically driven apparatus, a source of electrical energy, a switch electrically

connecting said electrically driven apparatus and said source of electrical energy, and a switch housing disposed within said novelty item, said switch housing comprising:

a first plate;

a layer of resilient material attached to one face of said first plate;

a second plate attached to said layer of resilient material, said second plate having an aperture which passes therethrough from one face to an opposite face of said second plate;

a container in sealed attachment to the face of said second plate opposite the face to which said resilient material is attached, said container enclosing said switch; and

switch actuating means operating so that squeezing of said novelty item moves said first plate toward said second plate compressing said resilient material and causing said switch to be actuated thereby energizing said electrical driven apparatus.

4,547,636

SLIDABLE CONTACT ASSEMBLY

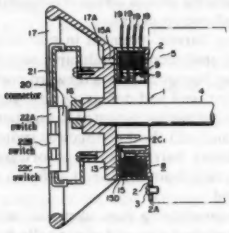
Shigeo Mizuno; Kazuhisa Kubota, and Takahumi Ichikawa, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Aug. 30, 1983, Ser. No. 527,659

Claims priority, application Japan, Aug. 31, 1982, 57-130539[U]

Int. Cl.⁴ H01H *9/00*

U.S. Cl. 200—61.54 **6 Claims**



1. A slidable contact assembly unit in combination with switches mounted on a steering wheel assembly of a vehicle, which comprises

a base member and a cover member, said members being supported on the vehicle steering wheel assembly such that one member rotates relative to the other when the steering wheel is rotated and about an axis of steering wheel rotation,

said base member having a peripheral wall disposed symmetrical of said axis, said base member further having a flange at one end of said peripheral wall,

a plurality of ring-like contacts made of thin conductive plates and disposed encirclingly on said peripheral wall,

ring-like spacers made from insulating material and disposed between the adjacent ones of said pluarlity of ring-like contacts to insulate them from each other, the outer diameter of each spacer being larger than that of each contact thereby defining an annular recess between adjacent spacers, and

a plurality of spring contacts made of conductive wire and supported by the cover member, said spring contacts each being urged into contact with an associated one of said ring-like contacts and remaining in contact thereto when said base and cover members are rotated one relative to the other,

each ring-like contact being provided with a radially directed terminal for connection of a lead wire thereto, said base member peripheral wall having two slits extending therein coaxial with the rotation axis, the terminals of alternate ones of said ring-like contacts being received in one of said base slits and the terminals of the remaining ring-like contacts being received in the other base slit thereby to prevent said ring-like contacts from coming into shorting contact one with the others,

said cover member having a peripheral wall part, said cover wall part having two slits formed therein coaxial with said rotation axis, a portion of alternate ones of said spring contacts being received in one of said cover slits, and portions of the remaining ones of said spring contacts being received in the other cover slit thereby to prevent said spring contacts from coming into shorting contact one with the other.

4,547,637

PISTON OPERABLE SWITCH

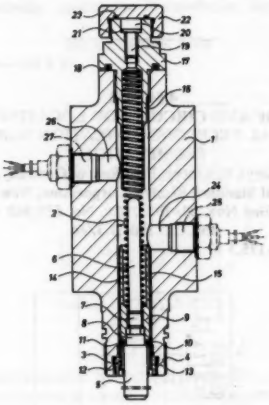
Gunter Peter, Theley, Fed. Rep. of Germany, assignor to Gesellschaft fur Hydraulik-Zubehor mbH, Fed. Rep. of Germany

Filed Dec. 20, 1983, Ser. No. 563,570

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1982, 3247210

Int. Cl.⁴ H01H *9/02*

U.S. Cl. 200—82 R **9 Claims**



1. A switch operable by a piston which is movable within a piston chamber, comprising:

a switch housing having a longitudinal bore extending therethrough;

a hollow housing member extending from one end of said switch housing into said longitudinal bore and having an outer surface in said longitudinal bore;

a tubular switch member axially movable in said longitudinal bore between a first position remote from said housing member and a second position adjacent said housing member, said switch member having an inner surface with transverse cross-sectional dimensions greater than those of said housing member outer surface;

a central pin fixedly coupled to said switch member, said pin extending within said switch member and being radially spaced from said inner surface of said switch member;

a helical spring engaging and extending between said switch member and said housing member, said spring having a first end portion received within said housing member and an opposite second end portion surrounding said pin and received within said switch member, said pin and said housing member radially supporting said spring against bending in all positions of said switch member;

switch means, mounted in said switch housing, for sensing the position of said switch member.

4,547,638
VACUUM INTERRUPTER

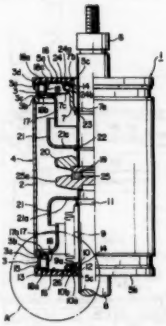
Yutaka Kashimoto, Numazu; Masayuki Kano, Shizuoka, and Toshimasa Fukai, Numazu, all of Japan, assignors to Kabushiki Kaisha Meidensha, Japan

Filed May 12, 1983, Ser. No. 493,922

Claims priority, application Japan, May 20, 1982, 57-73655[U]

Int. Cl.⁴ H01H *33/66*

U.S. Cl. 200—144 B **10 Claims**



1. A vacuum interrupter having a vacuum envelope, comprising:

at least one disc-shaped insulating end plate of insulating ceramics which has a closable aperture of a center thereof;

inner-diameter side and outer-diameter side metallized layers which are respectively formed in an inner-diameter region of a sealing surface of said plate and an outer-diameter region of said plate, said inner and outer metallized layers each having an edge within said vacuum envelope, said edges separated from one another;

a cylindrical metallic housing having at least one opening end which is hermetically brazed to said outer-diameter side metallized layer; and

a metallized-layer-edge shield means provided within said vacuum envelope near at least one of the spaced edges of the inner-diameter side and outer-diameter side metallized layers, for preventing occurrence of electric field concentration at the edge of said metallized layers.

4,547,639
VACUUM CIRCUIT BREAKER

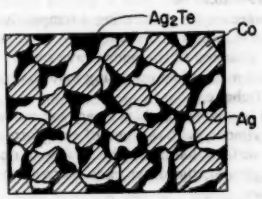
Ryuji Watanabe, Ibaraki; Kiyoji Iwashita, Hitachi; Sadami Tomita, Katsuta; Keiichi Kuniya, and Hideaki Tsuda, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 17, 1981, Ser. No. 274,679

Claims priority, application Japan, Jun. 18, 1980, 55-81425

Int. Cl.⁴ B22F *3/00*; H01H *33/66*

U.S. Cl. 200—144 B **23 Claims**



1. A vacuum circuit breaker comprising a vacuum vessel and a pair of electrodes disposed in the vessel and provided with contacts, at least a contact of at least one of said electrodes comprising a member having a skeleton of at least one iron group element selected from the group consisting of Fe, Ni and Co, pores of said skeleton being impregnated with at least one material selected from the group consisting of an alloy of Ag and at least one of Te, Se, Bi, Pb, Tl, In, Cd, Sn and Sb; and an intermetallic compound of Ag and at least one of Te, Se, Bi, Pb, Tl, In, Cd, Sn and Sb, the member, having a skeleton of said at least one iron group element the pores of which are impregnated with said at least one material selected from said alloy of Ag and said intermetallic compound of Ag, reducing the value of the chopping current while, at the same time, improving the breaking performance.

20. A vacuum circuit breaker comprising a vacuum vessel and a pair of electrodes arranged in the vessel and provided with contacts, at least a contact of at least one of said electrodes comprising a member having a skeleton of at least one iron group element from the group consisting of Fe, Ni, and Co, pores of said skeleton being impregnated with at least one material selected from the group consisting of an alloy of Ag and at least one of Te, Se, Bi, Pb, Tl, In, Cd, Sn and Sb; and an intermetallic compound of Ag and at least one of Te, Se, Bi, Pb, Tl, In, Cd, Sn and Sb, said breaker having a rated voltage of 3.6 to 36 KV and rated breaking currents of 8 to 60 KA, said breaker having a maximum chopping current value not more than 3 A and mean chopping current value not more than 1.5 A when breaking tests are effected with respect to the circuit of 100 V and current not more than 10 A, the member, having a skeleton of at least one iron group element the pores of which are impregnated with the at least one material selected from the group consisting of said alloy of Ag and said intermetallic compound of Ag, reducing the value of the chopping current while, at the same time, improving the breaking performance.

4,547,640
ELECTRICAL CONTACT STRUCTURE OF A VACUUM INTERRUPTER

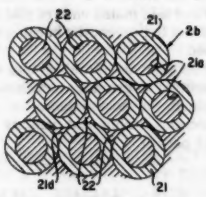
Yoshiyuki Kashiwagi, Tokyo; Takamitsu Sano, Yokohama, and Kaoru Kitakizaki, Tokyo, all of Japan, assignors to Kabushiki Kaisha Meidensha, Japan

Filed Sep. 29, 1982, Ser. No. 428,237

Claims priority, application Japan, Oct. 1, 1981, 56-156469; Mar. 5, 1982, 57-34939

Int. Cl.⁴ H01H *33/66*

U.S. Cl. 200—144 B **18 Claims**



1. An electrical contact structure of a vacuum interrupter in which a pair of electrical contacts are provided within a vacuum vessel by means of a pair of contact rods so that one electrical contact is in selective contact with the other electrical contact, wherein each of said electrical contacts comprises a substantially disk-shaped contact body and a contact portion on said contact body, said contact body including material of low electrical conductivity and material of high electrical conductivity, said high electrical conductivity materials carrying the majority of the electrical current flow through the contact body, said material of high electrical conductivity being metal having an electrical conductivity higher than that of said material of low electrical conductivity, said material of high electrical conductivity having a melting point lower than that of said material of low electrical conductivity, and said

material of high electrical conductivity being formed in situ from a molten metal melted to penetrate the material of low electrical conductivity in the direction of the thickness of said contact body,

the improvement wherein said contact body comprises a plurality of discrete portions of said high electrical conductivity material extending through the contact body and spaced from each other by a plurality of portions of said low electrical conductivity material, said high electrical conductivity portions being separated from each other by said low electrical conductivity portions.

4,547,641

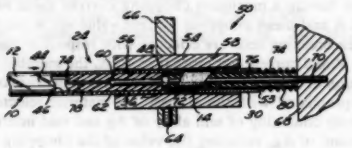
METHOD FOR DIELECTRICALLY JOINING TUBULAR MEMBERS

Perry A. Nebergall, 2241 Lombardi, Laguna Hills, Calif. 92653, and Robert C. French, 22845 Willard Ave., El Toro, Calif. 92630

Division of Ser. No. 149,568, May 14, 1980, Pat. No. 4,419,095. This application Feb. 1, 1983, Ser. No. 463,029

Int. Cl.⁴ H05B *6/54*

U.S. Cl. 219—10.41 **6 Claims**



1. A method for integrally joining mated ends of a pair of polymeric tubular members together to form a cannula for insertion into a patient's body, said method utilizing a dielectric heating device having a pair of electrodes positioned adjacent said mated ends of said tubular members, comprising:

abutting said mated ends of said tubular members to form a common joint;

passing a high frequency electrical current between said electrodes and through said mated ends of said tubular members to heat said members and fuse them together at said joint to form said integral cannula;

permitting the hot ambient air in the interstices between said electrodes and said mated ends of said tubular members to escape in order to prevent the burning or scorching of said cannula; and

forming said mated ends of said tubular members while in a heated condition to provide smooth surfaces on said cannula to inhibit the accumulation of mucous and other bodily secretions within said cannula and to prevent injury to said patient.

4,547,642

COMBINATION MICROWAVE AND THERMAL SELF-CLEANING OVEN WITH AN AUTOMATIC VENTING ARRANGEMENT

Peter H. Smith, Anchorage, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jan. 3, 1983, Ser. No. 454,972

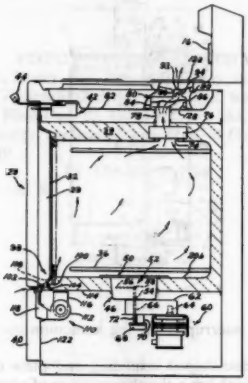
Int. Cl.⁴ H05B *6/64*

U.S. Cl. 219—10.55 B **3 Claims**

1. In a combined microwave and thermal self-cleaning oven of the type having a plurality of operating modes including a microwave mode and a self-cleaning mode, and comprising an oven cavity formed by a box-like oven liner having an access opening formed in one wall thereof, a door for closing said opening, a sealing gasket to seal the space between said liner and door when said door is closed, an exhaust passageway for venting air from said cavity, a catalytic oxidation unit interposed in said exhaust passageway for decomposing gases generated in the self-cleaning mode, and a restricted air inlet passageway defined by a gap through said sealing gasket and configured to meter only a regulated amount of outside air into said cavity to facilitate the controlled combustion of exhaust gases in the oxidation unit when the oven is operating in the self-cleaning mode, the improvement comprising:

sensing means for sensing the relative humidity of air exiting the cavity through the exhaust passageway;

blower means including a blower outlet positioned adjacent said gap operative when energized to increase the flow rate of outside air into the cavity through said gap;



blower control means responsive to said sensing means and operative to energize said blower means only when the sensed relative humidity level exceeds a predetermined threshold level indicative of excessive humidity in the cavity; and

means for enabling energization of said blower means only when operating in the microwave mode or the microwave/bake mode;

whereby when operating in the microwave mode or microwave/bake mode, humid air is purged from the cavity thereby preventing a steam buildup in the cavity.

4,547,643

TEMPERATURE SENSING PROBE FOR MICROWAVE OVEN APPLICATION

Juichi Yamauchi, Ibaragi, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 4, 1983, Ser. No. 538,903

Claims priority, application Japan, Oct. 6, 1982, 57-152699[U]; Oct. 22, 1982, 57-160501[U]; Oct. 22, 1982, 57-160502[U]

Int. Cl.⁴ H05B *6/64*

U.S. Cl. 219—10.55 R **7 Claims**

1. A connector for connecting a temperature sensing probe to the control circuit of a microwave oven comprising;

a choke attached to the microwave oven,

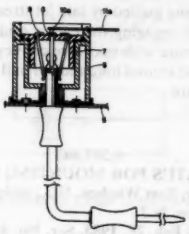
a cylinder made of an insulating material rotatably disposed in said choke,

first and second spring bias means operatively connected to said cylinder, with one end of each forming a conducting plane surface that meets the surface of one end portion of said cylinder, the other ends thereof extending into said cylinder,

first and second contact elements elastically contacting the plane surfaces of said first and second spring means, and

a temperature sensing probe provided at one end thereof with a plug which is held by the spring bias of said first and second spring means, whereby said plug which is held

within said choke by said cylinder is free to rotate with said cylinder, so that the temperature data detected by the



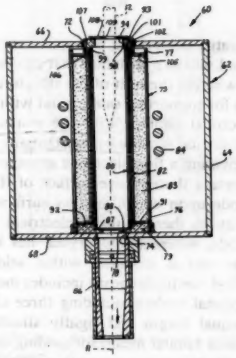
temperature sensing probe can be output from the contact elements.

4,547,644

APPARATUS FOR HEATING A PREFORM FROM WHICH LIGHTGUIDE FIBER IS DRAWN

Wallace C. Bair, Atlanta; Daryl L. Myers, Lawrenceville, and Jane W. Rogers, Atlanta, all of Ga., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Feb. 24, 1984, Ser. No. 583,532
Int. Cl.⁴ H05B *5/00, 6/00*
U.S. Cl. 219—10.49 R **15 Claims**



1. A furnace for heating a preform in order to draw lightguide fiber therefrom, said furnace comprising:

a container which includes a sidewall and a base having an opening therethrough;

a tubular element having a bore into which the preform extends, said tubular element being supported on said base in alignment with said opening and enclosed by said sidewall;

means for causing the temperature of an optical preform which extends into said bore to be increased to facilitate the drawing of lightguide fiber therefrom;

insulating means disposed between said sidewall of said container and said tubular element; and

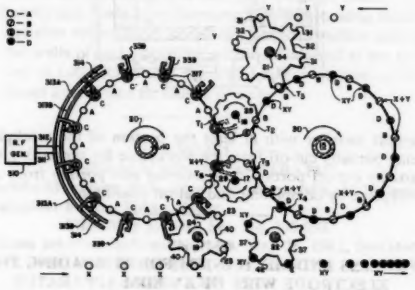
sealing means engaging said insulating means and extending across said base between and in compliant engagement with said container and said tubular element for preventing substantially the movement of contaminating particulates from said insulating means into the bore and for preventing unintended lateral movement of the tubular element.

4,547,645

MATERIAL HANDLING METHOD AND APPARATUS THEREFOR

Robert P. Smith, Crystal Lake; William S. Gillespie, Barrington; Hal L. Inglis, Fox River Grove, and Donald B. Hoyne, Cary, all of Ill., assignors to American Can Company, Greenwich, Conn.

Filed Feb. 1, 1983, Ser. No. 462,912
Int. Cl.⁴ H05B *6/06*
U.S. Cl. 219—10.67 **33 Claims**



1. A method of processing work comprising the steps of providing at least two rotating members each having a plurality of work stations for receiving workpieces to be continuously processed, depositing sequentially and individually a first series of workpieces into a first set of work stations of a first rotating member, depositing sequentially and individually a second series of workpieces into a first set of work stations of a second rotating member, transferring sequentially and individually the first workpieces from said first rotating member to said second rotating member, providing timing and transfer means between said members to shift said first workpieces so that said first and second workpieces register with one another on said second rotating member facilitating an assembly of individual workpieces of each said series, transferrign and shifting said assemblies of first and second workpieces sequentially and individually from said second rotating member to a second set of work stations on said first rotating member for further processing, thereafter transferring and shifting said assemblies sequentially and individually from said first rotating member to a second set of work stations on said second rotating member and removing said assemblies sequentially and individually from said second rotating member.

4,547,646

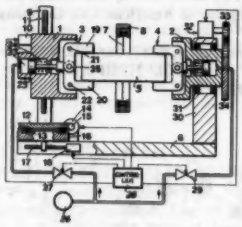
METHOD AND APPARATUS FOR CUTTING OFF A PORTION OF A WORKPIECE BY ELECTRICAL DISCHARGE MACHINING, AND FOR SUPPORTING THE PORTION CUT OFF FROM THE WORKPIECE

Jean-Paul Briffod, Lucinges, France, assignor to Ateliers des Charmilles, S.A., Geneva, Switzerland

Filed Mar. 21, 1983, Ser. No. 477,087
Claims priority, application Switzerland, Apr. 8, 1982, 2189/82
Int. Cl.⁴ B23P *1/08;* B23Q *3/08;* B26D *7/02*
U.S. Cl. 219—69 W **7 Claims**

1. A method for cutting off a portion from a conductive workpiece by means of an electrode wire EDM apparatus, said workpiece being held by a pair of workpiece support members mounted on a bed, said bed being movable relative to an electrode wire for effecting on said workpiece a cut of predetermined path, said method comprising supporting said workpiece by both said support members, effecting a partial cutting operation by electrical dischanges through said workpiece for partially cutting off a portion from said workpiece, disengag-

ing one of said support members from said workpiece, displacing said disengaged support member relative to the other support member to a position permitting to re-engage said



support member with at least the portion of the workpiece being partially cut-off from the workpiece for supporting said partially cut-off portion, and severing said portion from said workpiece by completing said cut-off operation.

4,547,647

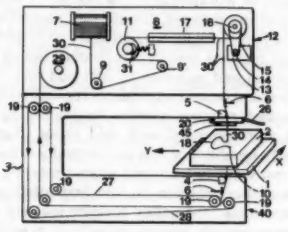
PROCESS AND MECHANISM FOR THREADING THE ELECTRODE WIRE OF AN EDM APPARATUS

Rudolf Schneider, Argovie, Switzerland, assignor to Ateliers des Charmilles, S.A., Geneve, Switzerland

Continuation of Ser. No. 512,936, Jul. 12, 1983, abandoned, which is a continuation-in-part of Ser. No. 246,072, Mar. 20, 1981, abandoned. This application Dec. 24, 1984, Ser. No. 685,340

Int. Cl.[4] B23P *1/08*

U.S. Cl. 219—69 W **3 Claims**



1. A method for threading and rethreading the electrode wire of a travelling wire EDM apparatus through an aperture in a workpiece, said method comprising feeding said wire from a supply spool to a braked roller, feeding said wire from said braked roller to a motor driven feed drum, heating said wire to a first temperature between said braked roller and said first drum for annealing said wire, simultaneously effecting a first longitudinal pull on said wire by means of said feed drum while being heated at said first temperature and being tensioned between said braked roller and said feed drum, allowing said wire to cool to a second temperature lower than said first temperature and higher than ambient temperature, effecting a second longitudinal pull on said wire while at said second temperature for straightening said wire, passing said wire through a passageway in a stationary nozzle, said stationary nozzle being supplied with fluid for forming a jet stream of fluid maintaining said wire substantially coaxially in said nozzle passageway and in said jet stream of fluid, engaging said wire after passage through said nozzle passageway in a wire conveying mechanism whereby said wire conveying mechanism effects said second longitudinal pull on said wire at said second temperature between said feed drum and said wire conveying mechanism by over-running said feed drum by said wire conveying mechanism, cutting off said wire at a portion thereof downstream of said nozzle and proximate to said nozzle while simultaneously stopping said feed drum, aiming said jet stream of fluid to said aperture in the workpiece, restarting said feed drum for feeding the end of said wire through said aperture while being guided by said jet stream of fluid aimed at said aperture, and engaging the end of said wire after passage through said aperture with said wire conveying mechanism for re-establishing said second longitudinal pull on said wire at said second temperature.

4,547,648

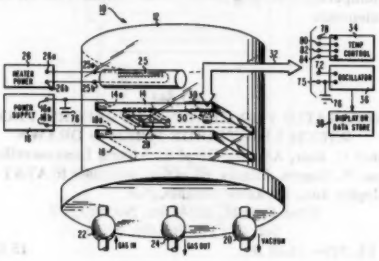
APPARATUS FOR MOUNTING CRYSTAL

Paul A. Longeway, East Windsor, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 28, 1983, Ser. No. 470,572

Int. Cl.[4] B23K *9/00, 23/00*

U.S. Cl. 219—121 PE **5 Claims**



1. An apparatus comprising a crystal-controlled oscillator crystal mounted within a structure that can be heated to high temperatures wherein the heat of the structure heats the crystal, and means for supporting said crystal within said structure such that electrical contact with the respectively opposite surfaces of the crystal is made by substantially minimum stress loading by providing a first electrode arranged to rest on and electrically contact thereby one surface of the crystal and a second electrode upon which another surface of said crystal rests by gravity to thereby make electrical contact to said second electrode, wherein said crystal has top and bottom major surfaces and is mounted within said structure and wherein said first electrode means includes means for contacting said top crystal surface including three electrode pins of substantially equal length and rigidly attached to a planar member, insulator tubular means for guiding each of said three respective electrode pins in a generally vertical path, said tubes being of substantially larger inside diameter than the diameter of said electrode pins so that said electrode pins maintain continuous contact with said top crystal surface even with temperature-induced surface deformations.

4,547,649

METHOD FOR SUPERFICIAL MARKING OF ZIRCONIUM AND CERTAIN OTHER METALS

Donald B. Butt, Lynchburg, and William C. Young, Roanoke, both of Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 4, 1983, Ser. No. 472,319

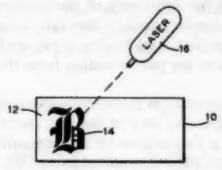
Int. Cl.[4] B23K *26/00*

U.S. Cl. 219—121 LF **14 Claims**

1. A nondestructive method of marking a metallic element of group 4b of elements in the periodic table comprising the sequential steps of:

oxidizing the surface of said metallic element to produce an oxide layer of a color that contrasts with the color of said metallic element; and

heating selected areas of the oxidized surface of said element locally to produce a contrasting mark by reduction of said



heated selected areas of oxide layer to said metallic element.

4,547,650

DEVICE FOR HEATING AN ANNULAR SURFACE ZONE OF A THREADLIKE OBJECT

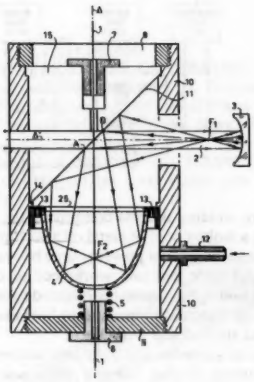
Hervé Arditty, Marly le Roi, and Philippe Graindorge, Magny les Hameaux, both of France, assignors to Thomson-CSF, Paris, France

Filed Dec. 8, 1983, Ser. No. 559,247

Claims priority, application France, Dec. 10, 1982, 82 20768

Int. Cl.⁴ B23K *26/06*

U.S. Cl. 219—121 LE **10 Claims**



1. A device for heating an annular surface zone of a threadlike object, comprising:

a carbon dioxide laser delivering a parallel beam,

a hollow body having an axis of symmetry and defining an inner enclosure,

means for causing said threadlike object to travel along a travel axis coaxial with said axis of symmetry,

a cylindrical object having an axis of symmetry coaxial with said travel axis, said cylindrical object having a bore therethrough along said axis thereof for allowing the threadlike object to travel, said cylindrical object having a slanting bearing surface which is a reflecting surface for the beam from the laser,

an ellipsoidal mirror disposed at a first end of said hollow body and fixed to the internal walls of said hollow body, said ellipsoidal mirror having an axis of symmetry coaxial with said travel axis, said ellipsoidal mirror having an aperture along said axis thereof to allow said threadlike object to travel, said ellipsoidal mirror defining first and second conjugate foci the second of said foci being situated on the travel axis,

means for focussing the beam from the laser at the first of said foci of the ellipsoidal mirror, the parallel beam from said laser having a direction perpendicular to the axis of travel of said threadlike object and included in a plane perpendicular to said slanting bearing surface,

wherein said focussing means comprise a spherical mirror, wherein said hollow body and said cylindrical object define two coaxial cylindrical bores, said bores extending perpendicular to said travel axis and being included in a plane perpendicular to said slanting bearing surface of said cylindrical object, wherein said spherical mirror has an axis of symmetry coaxial with an axis of symmetry of said bores, and wherein said spherical mirror is disposed on a side of the tubular shaped body opposite said laser,

whereby said beam after focussing by said focussing means and after reflection by said slanting bearing surface and by the walls of said ellipsoidal mirror is focussed at the second of said foci of said ellipsoidal mirror situated on the travel axis of said threadlike object.

4,547,651

LASER MACHINING APPARATUS

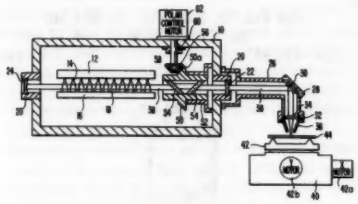
Masahiko Maruyama, Seto, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1982, Ser. No. 375,093

Claims priority, application Japan, May 28, 1981, 56-81445; Jul. 22, 1981, 56-114965; Sep. 18, 1981, 56-147152

Int. Cl.⁴ B23K *26/00*

U.S. Cl. 219—121 LG **15 Claims**



1. A laser machining apparatus comprising an optical resonator including a pair of partially and totally reflecting mirrors disposed in opposite relationship to each other and a laser medium disposed between said pair of partially and totally reflecting mirrors to generate a laser beam through the amplification by said laser medium, at least one polarizer disposed between said partially and totally reflecting mirrors to cross said laser beam and to be mechanically rotatable about the optical axis of said laser beam, said polarizer linearly polarizing said laser beam, and mechanical driving means for mechanically rotating said at least one polarizer about the optical axis of said laser beam so that said linearly polarized laser beam has a plane of polarization coinciding with a direction in which said linearly polarized laser beam machines a workpiece.

4,547,652

PROCESS FOR THE LASER SOLDERING OF FLEXIBLE WIRING

Hermann Raisig, Munich; Gregor Unger, and Oscar Wirbser, both of Germering, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 12, 1983, Ser. No. 560,776

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1982, 3247338

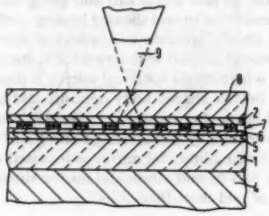
Int. Cl.⁴ B23K *26/00*

U.S. Cl. 219—121 LD **5 Claims**

1. A method for laser soldering of soldered connections of flexible wiring, wherein said method comprises the steps of:

(a) arranging said wiring on a transparent carrying film;

(b) providing said wiring at their respective contact points with a flux to promote thermal conduction therebetween;
(c) holding said contact points together by a clamp of transparent material so that they may be joined, said contact



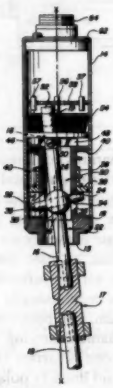
points being arranged so that surfaces to be joined are in contact with each other; and
(d) applying a non-contact heat source from a laser beam to said contact points to generate a solder connection.

4,547,653

SEAM TRACKER

Edgard A. Franco-Ferreira, Leucadia, Calif., and William J. Toohey, Pittsford, N.Y., assignors to Larry Russell, El Toro, Calif.

Filed Feb. 23, 1984, Ser. No. 582,745
Int. Cl.[4] B23K *9/12*
U.S. Cl. 219—124.34 **14 Claims**



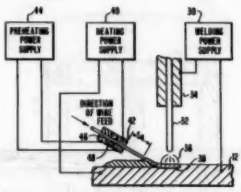
9. In a welding machine having a seam tracking apparatus, having a probe to be positioned in, and responsive to relative movement respective to the probe of, a welding zone, and a control apparatus for modifying the position of a welding head responsive to an output signal from the seam tracking apparatus, an improved apparatus for generating the output signal responsive to the movement of the probe in either of two possible degrees of freedom, comprising:
a seam tracker housing;
a seam tracker mounting unit disposed within the housing and having a longitudinal axis, and having an open ended interior opening of generally cylindrical shape with a longitudinal axis corresponding to that of the mounting unit, and having a flange at one end of the mounting unit;
a shaft connected to the probe at one end thereof and extending through one end of the interior opening and through the length of the interior opening, with the end of the shaft disposed at the other end of the interior opening forming a position-indicator member;
a ball joint disposed in the interior opening intermediate the one end and the other end of the interior opening, and having an interior passage through which the shaft is engageably passed, and having a pin with the opposing exterior ends of the pin extending from the surface of the ball joint;
a pair of opposed slots on the mounting unit each disposed to receive a respective end of the pin, thereby locking the ball joint to a first degree of motion within the interior opening, about the longitudinal axis of the pin; and
a sleeve slidably disposed on the outside of the mounting unit and having a flange, with a spring positioned between the flange of the mounting unit and the flange of the sleeve, to thereby urge the flange of the sleeve into abutment with the respective ends of the pin.

4,547,654

METHOD AND APPARATUS FOR ARC WELDING

Israel Stol, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 321,156, Nov. 13, 1981,. This application Jan. 23, 1984, Ser. No. 573,171
Int. Cl.[4] B23K *9/12*
U.S. Cl. 219—137 PS **2 Claims**



1. An arc welding process comprising the steps of:
creating a molten pool of metal on a workpiece to be welded by connecting a first power source between a nonconsumable electrode and said workpiece to create an arc between said non-consumable electrode and said workpiece;
connecting a second power source between a first electrode contact tip and said workpiece;
feeding a consumable electrode into said molten pool, while maintaining sliding contact with said first electrode contact tip; and
passing a preheating current through a fixed length of said consumable electrode before it leaves contact with said first electrode contact tip by connecting a third power source between a second electrode contact tip and said first electrode contact tip, wherein said first and second electrode contact tips are separated by a dielectric element and said consumable electrode passes through an opening in said dielectric element such that said dielectric element prevents lateral movement of said consumable electrode.

4,547,655

ELECTRICALLY HEATED STEERING WHEEL

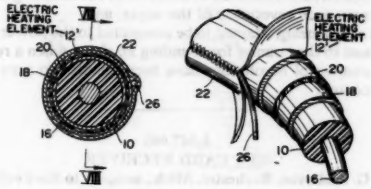
Hidenori Kurata, Zama; Kazuo Inaba, Fuji; Tomokazu Sugiyama, Fuji, and Tomio Hirata, Fuji, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 25, 1983, Ser. No. 545,361
Claims priority, application Japan, Nov. 2, 1982, 57-191781
Int. Cl.[4] H05B *3/16*; B62D *1/06*
U.S. Cl. 219—204 **11 Claims**

1. An electrically heated steering wheel comprising a rim portion adapted to be gripped by the driver's hands;
a heat conductive metallic sheet intimately covering and in direct contact with the outer surface of said rim portion;

an electrically insulating sheet intimately covering the outer surface of said heat conductive metallic sheet;

an electric heat generating member intimately covering the outer surface of said electrically insulating sheet, said electric heat generating member generating heat when electrically energized, said heat generating member having a pair of longitudinally spaced terminals adapted to be connected to a source of electric power;



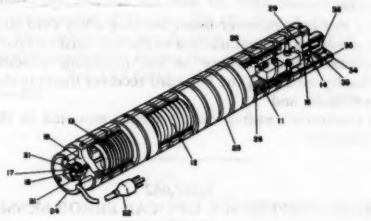
an outermost, electrically insulative cover wrapped around said rim portion in a manner to dispose therebetween said heat conductive metallic sheet, said electrically insulating sheet and said electric heat generating member.

4,547,656

PORTABLE SMOKE GENERATOR

Edmund Swiatosz, Maitland, and Paul D. Grimmer, Winter Park, both of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 9, 1984, Ser. No. 597,892
Int. Cl.⁴ H05B *1/00, 3/00*; F24H *1/14*
U.S. Cl. 219—300 **12 Claims**



1. An apparatus for generating smoke, comprising in combination:

electrically conductive tubing configured as a coil and having a plurality of sections having distinct I^2R heating properties and cross-sectional areas;

means for applying an electric current across the length of said tubing;

housing means for containing said tubing having a first aperture communicating with said tubing for discharge of smoke and a resealable aperture communicating with said tubing for insertion of smoke producing liquids, said housing providing electrical and thermal insulation about said tubing;

a destructable relief disk located in said first aperture providing means for discharging smoke; and

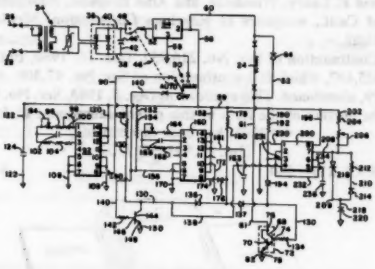
means for controlling the temperature of said tubing operably connected thereto.

4,547,657

POWER CONTROL UNIT

Charles K. Sticher, Jr., Snellville, and Michael D. Hartley, Roswell, both of Ga., assignors to Nordson Corporation, Amherst, Ohio

Filed Feb. 13, 1984, Ser. No. 579,433
Int. Cl.⁴ H05B *1/02*
U.S. Cl. 219—492 **10 Claims**



1. A power controller for placement between a source of electricity and electrically-powered heaters for heating thermoplastic material, the controller comprising:

a normally closed switch allowing electrical communication between the source and the heaters;

an electrical control circuit including a coil, said coil connected to said switch so as to open said switch when energized, said electrical control circuit further including:

a switch means, operable between an on and an off condition, for allowing the energization of said coil when in the on condition and preventing the energization of said coil when in the off condition;

a first timing means, operatively connected to said switch means, for causing said switch means to be in the on condition for a first selected duration after said electrical control circuit is energized; and

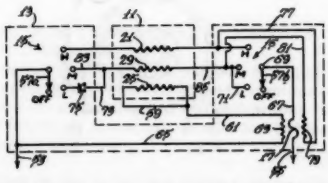
a second timing means, operatively connected to said switch means, for causing said switch means to be intermittently placed in the on condition.

4,547,658

MULTIPLE HEAT FUSING WIRE CIRCUIT FOR UNDERBLANKETS

George C. Crowley, Glenview, Ill., assignor to Sunbeam Corporation, Oak Brook, Ill.

Filed Jun. 13, 1984, Ser. No. 620,360
Int. Cl.⁴ H05B *3/02*
U.S. Cl. 219—539 **20 Claims**



1. The combination comprising a cable having an elongated core of insulating material on which three coextensive and helically wound wires are disposed, said wires being separated by a meltable layer of insulating material which maintains said wires separated at normal operating temperatures and melts under overheat conditions permitting the wires to contact each other, means connecting said wires to a source of electric power whereby when one of said wires functions as a heating

element at least one of the other two of said wires may function as a sensor element, means responsive to a reduction in resistance between said sensor element and the other of said wires to disable the power to said cable.

4,547,659

PTC HEATER ASSEMBLY

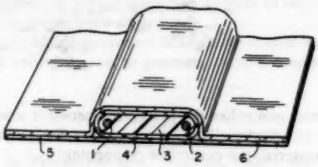
David F. Leary, Woodside, and Alan Brigham, Sunnyvale, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 216,952, Dec. 16, 1980, Pat. No. 4,425,497, which is a continuation of Ser. No. 67,309, Aug. 17, 1979, abandoned. This application Dec. 5, 1983, Ser. No. 558,631

The portion of the term of this patent subsequent to Jan. 10, 2001, has been disclaimed.

Int. Cl.⁴ H05B *1/02*

U.S. Cl. 219—544 **4 Claims**



1. A heater assembly which comprises

(a) a PTC heater which has a passive power rating of 70 to 200 watts/foot and which comprises

(i) an elongate strip of a conductive polymer PTC composition;

(ii) two elongate, parallel electrodes in physical and electrical contact with said strip; and

(iii) an electrically insulating jacket which surrounds said strip and said electrodes; and

(b) an envelope which substantially surrounds and is in intimate thermal contact with said PTC heater, which is electrically insulated from said elongate strip and said electrodes by said insulating jacket, and which is composed of a material having a thermal conductivity of at least 0.3 Cal/cm. °C. sec.

4,547,660

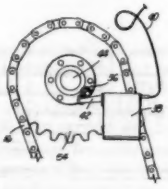
FEED BOX MONITORING DEVICE

Donald W. Whitson, 211 E. 5th, Scott City, Kans. 67871

Filed Mar. 7, 1983, Ser. No. 473,077

Int. Cl.⁴ G06M *1/00*

U.S. Cl. 235—103 **6 Claims**



1. A feed box monitoring device for counting the revolutions of an auger or the like used in mixing two or more feed ingredients in a feed box mounted on the rear of a vehicle or trailer, the device further alerting an operator when a uniform mix has been obtained, the device comprising:

a counter for counting the revolutions of the auger;

a control panel having a control panel switch for turning power on and off from a power source in the vehicle to the counter, the counter mounted on the control panel with the control panel adapted to be mounted in a cab of the vehicle;

a feed box switch connected to the power source and adapted for mounting adjacent the feed box, the switch having a switch arm for contacting part of the auger as it makes each revolution, the switch arm opening and closing the feed box switch during each revolution, the feed box switch connected to the counter for counting down to zero each revolution of the auger; and

an alarm means adapted to be connected to the power source and to the counter for sounding an alarm when a required number of revolutions have been counted to zero by the counter.

4,547,661

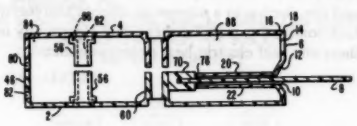
KEY CARD RECEIVER

Eric G. Anderson, Rochester, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 19, 1983, Ser. No. 496,042

Int. Cl.⁴ G06K *13/00*

U.S. Cl. 235—482 **9 Claims**



1. A key card receiver apparatus comprising:

(a) a first body half defining first front vestibule means, a first rear chamber and having a first plurality of mounting pedestals;

(b) a second, opposite complementary body half defining a second, complementary vestibule means, a second complementary rear chamber, and having a second plurality of mounting pedestals such that when assembled the body halves define a front vestibule, a rear chamber and the first and second mounting pedestals are in alignment with each other;

(c) a key card receiver insert defining a key card slideway;

(d) mounting means attached to the key card receiver insert contacting a plurality of the mounting pedestals for fixedly mounting the key card receiver insert in the front vestibule; and

(e) electronic reading circuit means mounted in the rear chamber.

4,547,662

NONINTERFERENCE OPTICAL ERROR SENSING SYSTEM

Dean F. Cornwell, Palm Beach Gardens, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Mar. 16, 1983, Ser. No. 475,801

Int. Cl.⁴ G01J *1/20*

U.S. Cl. 250—201 **6 Claims**

1. An apparatus for detecting errors in an optical system carrying a high power laser beam comprising:

means for deflecting a portion of said laser beam to form an amount of sample radiation;

means for collecting a test portion of said sample radiation;

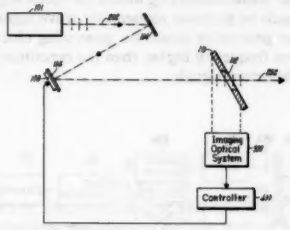
means for focusing said test portion of said sample radiation to at least one image, each of which includes an amount of image radiation;

detector means for detecting image radiation in said at least one image and forming signals representative of said image radiation; and

means for forming at least one set of image parameters from said representative signals; said image parameters being related in a predetermined manner to errors in said high power laser beam;

said means for deflecting a portion of said laser beam in-

cludes at least one single apertured optical surface intercepting said high power laser beam and being disposed within said optical system for deflecting said portion of said laser beam diffusely; and



said means for collecting a test portion of sample radiation is a reflective element positioned outside said laser beam.

4,547,663

FOCUS DETECTING APPARATUS WITH A COMPENSATION MASK

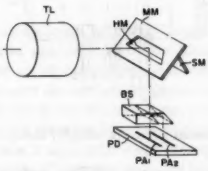
Nozomu Kitagishi, Kawasaki; Shin Yamaguchi, Hiratsuka; Shinji Sakai; Takao Kinoshita, both of Tokyo; Takashi Kawabata, Kamakura; Nobuhiko Shinoda, Tokyo, and Kazuya Hosoe, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 531,628, Sep. 13, 1983, abandoned, which is a continuation of Ser. No. 328,187, Dec. 7, 1981, abandoned. This application Apr. 5, 1984, Ser. No. 596,575

Claims priority, application Japan, Dec. 12, 1980, 55-176002

Int. Cl.⁴ G01J *1/20*

U.S. Cl. 250—201 **3 Claims**



1. A focus detecting apparatus, comprising:

an image forming optical system for forming an image of an object on a predetermined focal plane;

at least two photoelectric detectors disposed so as to maintain a predetermined positional relation therebetween relative to said predetermined focal plane;

light quantity regulating means for compensating for aberrations of said optical system and being disposed in the optical path of the light in said optical system coming towards said photoelectric detectors to decrease the quantity of the light continuously from the center to a marginal area of the optical path; and

means for measuring the state of focus of the object image formed on said predetermined focal plane by means of the outputs from said photoelectric detectors.

4,547,664

DIFFRACTION GRATING BEAM SPLITTER IN A LASER RESONATOR LENGTH CONTROL

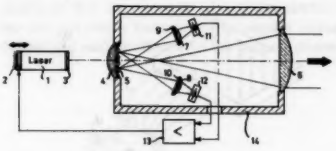
Peter Vogt, Heidenheim, and Horst Künzmann, Braunschweig, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Mar. 31, 1983, Ser. No. 480,821

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1982, 3212809

Int. Cl.⁴ G01J *1/32*

U.S. Cl. 250—205 **5 Claims**



1. In combination, a laser having a resonator emitting a laser beam, means for varying the length of the resonator, a beam expander comprising at least two lens elements, a diffraction grating on one of said lens elements, said grating transmitting at zero order nearly all of the beam intensity emitted from the resonator, and said grating diffracting from the relatively small remainder of the beam intensity at two higher orders and into two different regions offset from the path of zero-order transmission, cross-polarized analyzers positioned in the respective different regions, and means including separate detectors behind the respective analyzers and producing an electrical signal operatively connected to stabilize laser-beam frequency by correctively varying the length of the resonator.

4,547,665

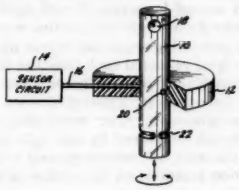
FIBER OPTIC POSITION SENSOR

William R. Little, Seattle, and Ted M. Daniels, Edmonds, both of Wash., assignors to Eldec Corporation, Lynnwood, Wash.

Filed Dec. 27, 1982, Ser. No. 453,488

Int. Cl.⁴ G01D *5/34*

U.S. Cl. 250—227 **16 Claims**



1. A fiber optic sensor for determining the position of an object, said sensor comprising:

an elongated optical fiber having an end face, said optical fiber being characterized by a limiting angle α measured relative to the longitudinal axis of said optical fiber beyond which a light ray cannot exit or enter said end face and still be transmitted along the length of said optical fiber;

an object surface on the object that remains substantially perpendicular to the longitudinal axis of said optical fiber, said object surface being reflective; and,

a nonreflective target area located on the object surface so as to contrast therewith and correspond to a position of the object to be determined, said target area consisting of a recess extending into the object from said object surface, said recess including first and second, opposing surfaces that are substantially equally inclined from said object surface and that have an included angle θ measured be-

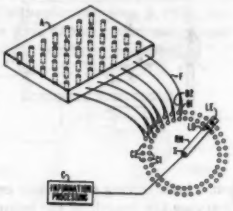
tween any two diametrically-opposed points thereon, where $90°+2\alpha<\theta<180°-2\alpha$.

4,547,666

MARK ARRAY SENSE READER WITH SEQUENTIAL OUTPUT SIGNALS

David Heal, Iowa City, Iowa, assignor to National Computer Systems, Inc., Eden Prairie, Minn.

Filed Jan. 19, 1983, Ser. No. 459,285
Int. Cl.[4] H04N 3/02
U.S. Cl. 250—227 **5 Claims**



1. In an optical reading system for determining the presence or absence of mark information at a plurality of discrete mark information locations on a document, the combination of,

a document reading head array having a plurality of discrete mark reading locations which have a one-to-one correspondence with the discrete mark information locations on said document,

a plurality of bifurcated light fibers, each fiber having one bifurcated end with first and second branches and one single end, the single ends of said light fibers being arranged to form the mark reading locations of said reading head array, with each single end functioning to detect the presence or absence of a mark at a discrete mark information location on the surface of the document contacting the reading head array, the first and second branches of the bifurcated ends of each light fiber being arranged in pairs in a serial array,

a mark sensor means having a single light source and a single light detector for sequentially interfacing with the pairs of first and second branches of each light fiber, said light source introducing light into the first branch and said light detector generating sequential output signals indicative of the light level reflected back from the document through the second branch and of the presence or absence of a mark at each mark information location, and

information processing means responding to the sequential output signals developed by said light detector means to process the mark information present at the discrete mark information locations on the surface of a document contacting the reading head array.

4,547,667

DISPLACEMENT MEASURING DEVICE UTILIZING AN INCREMENTAL CODE

Tsuneo Sasaki; Fumio Ohtomo; Takashi Yokokura, and Fumitomo Kondo, all of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP82/00119, § 371 Date Dec. 10, 1982, § 102(e) Date Dec. 10, 1982, PCT Pub. No. WO82/03682, PCT Pub. Date Oct. 28, 1982
PCT Filed Apr. 12, 1982, Ser. No. 453,880
Claims priority, application Japan, Apr. 13, 1981, 56-55405
Int. Cl.[4] G08C 9/06; H03K 13/02
U.S. Cl. 250—231 SE **21 Claims**

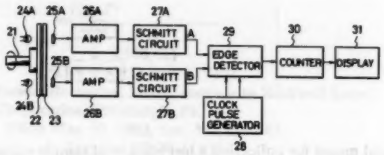
1. A device for measuring displacement characterized in that it comprises:

a coding member carried by an object to be measured and having an coding section capable of causing sensing elements to generate signals which can be discriminated as "0" and "1";

sensing means arranged to sense the coding section of the coding member and adapted to generate detection signals in response to displacement of the coding member;

rectangular wave-converting means for receiving the detection signals to generate rectangular wave signals;

clock pulse generating means for generating clock pulses of repetition frequency higher than the repetition-frequency of the detection signals;



edge detecting means for receiving the rectangular wave signal and the clock pulse to generate, as an output pulse, a clock pulse substantially coinciding with at least one of the leading and trailing edges of the rectangular wave signal;

a main counter for counting the output pulses from the edge detecting means; and

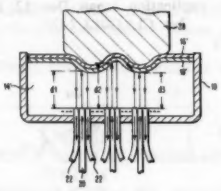
a display unit for displaying the counted value of the main counter.

4,547,668

TWO-DIMENSIONAL PRESSURE SENSOR USING RETRO-REFLECTIVE TAPE AND SEMI-TRANSPARENT MEDIUM

Constantine Tsikos, Pennsauken, N.J., assignor to Siemens Corporate Research & Support, Inc., Iselin, N.J.

Filed Sep. 14, 1983, Ser. No. 531,984
Int. Cl.[4] G01D 5/34; G01B 11/14
U.S. Cl. 250—231 P **7 Claims**



1. A two-dimensional pressure sensor, comprising:

(a) a light source;

(b) a matrix of light transmitting fiber endings comprising a plurality of fibers for transmitting said light from said light source and a plurality of fibers for receiving reflected light;

(c) a transmitting fiber sub-array comprising endings of said transmitting fibers located a distance from said matrix of light transmitting fiber endings, said endings located to receive light from said light source;

(d) a receiving fiber sub-array, comprising endings of said receiving fibers located a distance from said matrix of light transmitting fiber endings;

(e) a retro-reflective material located a distance above said matrix;

(f)[a] a semi-transparent deformable medium located between said matrix and said retro-reflective material, said semi-transparent deformable medium supporting said retro-reflective material;

(g) a flexible membrane located adjacent said retro-reflective material side farthest from said matrix; and

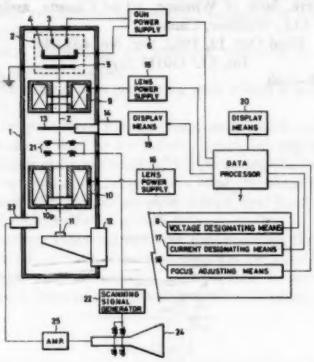
(h) means located adjacent said receiving fiber sub-array, for detecting said reflected light transmitted by said light fibers from said matrix to said receiving fiber sub-array.

4,547,669

ELECTRON BEAM SCANNING DEVICE

Seiichi Nakagawa, and Setsuo Norioka, both of Tokyo, Japan, assignors to Jeol Ltd., Tokyo, Japan

Filed Sep. 22, 1983, Ser. No. 534,833
Claims priority, application Japan, Sep. 27, 1982, 57-168178
Int. Cl.⁴ G01N *23/00*
U.S. Cl. 250—310 **7 Claims**



1. In an electron beam scanning device having an electron gun, an electron optical system including at least one condenser lens and an objective lens, said lenses for directing the electron beam over the surface of a specimen and an apertured baffle through which the electron beam passes for selecting the angle cone of the electron beam converging in a spot on the specimen surface, a specimen stage for shifting the specimens along the direction of the beam axis, the improvement comprising:

(a) first means for generating an input signal indicative of the desired electron beam accelerating voltage (Ve) in the electron gun;

(b) second means for generating an input signal indicative of the desired beam current (Ie) on the specimen surface;

(c) means for positioning the apertured baffle in order to change the selected aperture diameter (Da);

(d) first means for visual display of the selected electron beam current;

(e) second means for visual display of an operating condition for the baffle positioning means indicative of a selected aperture diameter (Da);

(f) third means for generating an input signal indicative of the distance (Wd) between the specimen and the principal plane of the objective lens;

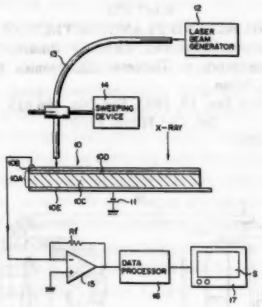
(g) a data processor having a central processing unit and associated random access memory and means for receiving the input signals indicative of selected accelerating voltage (Ve) and selected specimen current (Ie), and means for outputting a signal to the first and second visual display means, said random access memory having stored therein data that defines the optimum baffle position for selected Ie, Ve, and Wd, said random access memory having stored therein a task for referring to the data for determining a desired operating condition of the baffle positioning means based upon the inputs from the first (Ve), second (Ie), and third (Wd) input signal generating means so that the diameter (dp) of the electron beam spot on the specimen becomes a minimum value (dm) and outputting said condition to the second display means.

4,547,670

TWO-DIMENSIONAL RADIATION DETECTING APPARATUS

Hiroshi Sugimoto, Tochigi, and Yujiro Naruse, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 19, 1983, Ser. No. 486,514
Claims priority, application Japan, Apr. 20, 1982, 57-64685
Int. Cl.⁴ G01T *1/24*; H01L *31/02*
U.S. Cl. 250—370 **11 Claims**



1. A two-dimensional X-ray detecting apparatus comprising:

a substrate;

two-dimensional radiation detecting means containing an electron trapping layer laminated on said substrate and made of material to trap the number of electrons proportional to an amount of radiation in a trap level in a forbidden band when said trapping layer is irradiated, and an electrode layer laminated on said electron trapping layer;

biasing means for reverse-biasing said electron trapping layer with respect to a reference potential; and

scanning means for scanning said electron trapping layer to take out said trapped electrons from said electron trapping layer into said electrode layer.

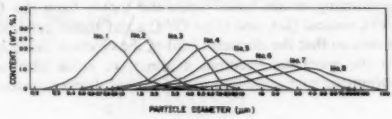
4,547,671

Patent Not Issued For This Number

4,547,672
RADIATION IMAGE STORAGE PANEL

Satoshi Arakawa, and Kenji Takahashi, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co. Ltd., Kanagawa, Japan

Filed Apr. 18, 1983, Ser. No. 485,834
Claims priority, application Japan, Apr. 20, 1982, 57-65609
Int. Cl.[4] G01J *1/58*
U.S. Cl. 250—483.1 7 Claims

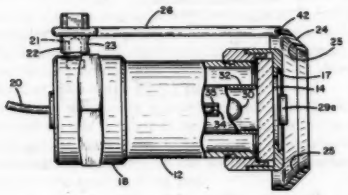


1. A radiation image storage panel having a phosphor layer comprising a binder and a stimulable phosphor dispersed therein, in which said stimulable phosphor has such a particle size distribution that phosphor particles having a diameter of not less than 100 μm are present in an amount of not more than 1% by weight and phosphor particles having a diameter of not less than 1 μm are present in an amount of not less than 50% by weight.

4,547,673
SMOKE AND FLAME DETECTOR

Theodore E. Larsen, Edina, and Michael P. Juaire, Chaska, both of Minn., assignors to Detector Electronics Corporation, Minneapolis, Minn.

Filed Jan. 10, 1983, Ser. No. 456,615
Int. Cl.[4] H05B *33/00*
U.S. Cl. 250—554 6 Claims

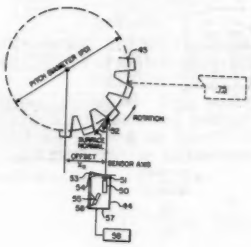


1. An apparatus for detecting smoke, vapor and flame, comprising
(a) a tubular housing concentric about an axis, said housing having a closed rear end and an open front end, and a light transparent window covering said open front end;
(b) a radiation detection device aligned along said axis inside said housing, said device having a light sensitive element facing toward said window;
(c) a first light source affixed to said housing proximate said closed rear end, and an optical shield about said light source, said shield having a forwardly facing opening to permit light from said light source to pass external said housing and parallel to said axis; and
(d) a circular ring concentric with said window and attached to said housing about said axis forward of said window, said ring having a beveled rear reflective surface inclined toward said window and facing generally toward said shield opening, to receive light from said first light source and to reflect same to said radiation detection device through said windows.

4,547,674
OPTICAL TRIANGULATION GEAR INSPECTION

Timothy R. Pryor, Tecumseh; Omer L. Hageniers, and Walter P. T. North, both of Windsor, all of Canada, assignors to Diffracto Ltd., Windsor, Canada

Filed Oct. 12, 1982, Ser. No. 433,644
Int. Cl.[4] G01H *21/86*
U.S. Cl. 250—560 28 Claims

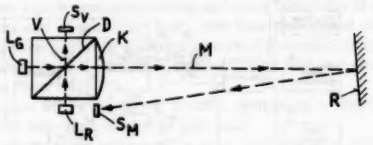


1. A method of determining gear geometry comprising:
(a) providing a gear in an inspection position, said gear having a gear axis;
(b) providing a light source for projecting a zone of light onto a surface of a gear at a first surface location, said light being projected onto said surface in a direction whch is offset from a gear radius when viewed along the gear axis;
(c) providing a light detector for detecting a image of said zone of light;
(d) determining the position of a detected image of said zone of light;
(e) determining from the determined image position, the location of the gear surface on which said zone of light was projected;
(f) moving said gear relative to said light source such that said light source is positioned to project a zone of light onto said gear surface at a second surface location different from said first surface location;
(g) repeating steps (b) through (f); and
(h) determining, from a plurality of determinations of the location of the gear surface on which said zone of light was projected, geometry of said gear.

4,547,675
SMOKE DETECTOR OPERATING ACCORDING TO THE RADIATION EXTINCTION PRINCIPLE

Jürg Muggli, and Martin Labhart, both of Männedorf, Switzerland, assignors to Cerberus AG, Männedorf, Switzerland

Filed Dec. 7, 1981, Ser. No. 328,403
Claims priority, application Switzerland, Dec. 18, 1980, 9342/80
Int. Cl.⁴ G01N *21/00*
U.S. Cl. 250—565 **58 Claims**



1. In a smoke detector operating according to the radiation extinction principle, wherein the radiation attenuation caused by smoke is detected in a measuring path and at a predetermined radiation attenuation there is triggered a signal by means of an evaluation circuit, the improvement which comprises:

a radiation transmitter for emitting radiation in a long wave spectral region;

a radiation transmitter for emitting radiation in a shorter wave spectral region;

means for providing a measuring path which is accessible to smoke;

means for providing a comparison path which is accessible to smoke at least to a relatively restricted degree;

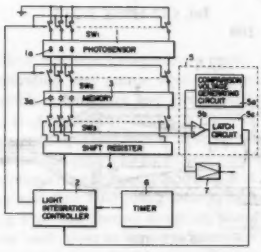
a measuring radiation receiver for receiving the radiation of said two radiation transmitters after the same has passed through said measuring path which is at least relatively readily accessible to smoke; and

a comparison radiation receiver for receiving the radiation of said two radiation transmitters after the same has passed through said comparison path which is accessible to smoke at least to a relatively restricted degree.

4,547,676
PHOTOSENSOR APPARATUS WITH LIGHT INTEGRATION CONTROL

Takeomi Suzuki; Kenzo Ishibashi, and Isamu Hashimoto, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 24, 1983, Ser. No. 460,627
Claims priority, application Japan, Jan. 25, 1982, 57-8801
Int. Cl.⁴ H01J *40/14*
U.S. Cl. 250—578 **1 Claim**



1. A photosensor apparatus comprising:

a light-receiving element array consisting of a plurality of light integration type light-receiving elements;

memory means consisting of plural memory elements each connected to a respective one of said light-receiving elements via a respective one of a plurality of switches for, after the light-receiving elements start the light integration, storing an output signal of the said respective one of the light-receiving elements while the one switch is closed to thereby perform sampling, and said memory means holding the output signal of said light-receiving elements substantially simultaneously when said switches are opened at any instant;

scanning means for scanning the memory elements corresponding to at least some of said light-receiving element array during the sampling or after the holding and for progressively obtaining the outputs of these light-receiving elements;

comparing means for comparing the output signals of the light-receiving elements progressively obtained by said scanning means with a first of two reference levels, and said comparing means comparing said output signals with a second of said two reference levels dependent upon a control signal, said second reference level corresponding to a greater degree of received light than said first reference level;

time counting means for counting the light integration time period during which said light-receiving elements are producing a charge due to the light received thereby and during the storage of the charges from the start of the light integration;

control means for controlling the switches connecting respective memory means and light-receiving elements and for controlling said scanning means, said control means coupled to said comparing means and being effected thereby, said control means including:

a means for closing said switches and starting said time counting means simultaneously with the start of light integration by said light-receiving elements;

a first means for timed actuation of said scanning means after the closure of said switches by said first means;

means for opening said switches thereby causing said memory means to hold all the output signals from the light-receiving elements substantially simultaneously and for stopping the counting of said time counting means when one of said output signals exceeds said first reference level based upon said comparing means;

a second means for actuating said scanning means and for generating said control signal to effect the comparison each of the output signals to said second reference level in said comparing means;

means for identifying the output signals as effective detection signals when none of the output signals exceeds said second reference level based upon said comparing means;

means for restarting the light integration period;

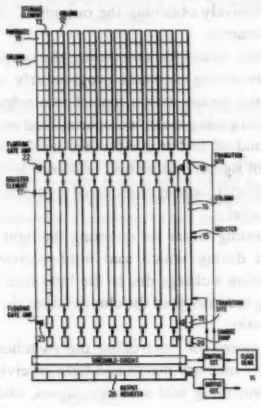
means for reducing the timed actuation of said scanning means and reducing the light integration time period when any one of said outputs exceeds said second reference level based upon the comparison in said comparing means, said means for reducing obtaining a ratio of the count in said time counting means and effecting the timed actuation of said scanning means in accordance with said ratio;

means for further restarting the light integration period utilizing the reduced light integration time period and for further reducing the light integration time period until all of the outputs do not exceed said second reference level based upon said comparison means.

4,547,677
RADIATION DETECTING APPARATUS FOR DETECTING A BRIEF RADIATION SIGNAL

John C. Parker, Edinburgh, Scotland, assignor to Ferranti, plc, London, England

Filed Jun. 17, 1983, Ser. No. 505,280
Claims priority, application United Kingdom, Jun. 24, 1982, 8218551
Int. Cl.[4] H01L 27/10; H04N 3/15
U.S. Cl. 250—578 9 Claims

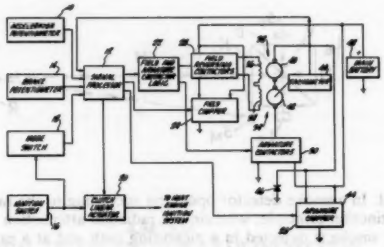


1. Radiation detecting apparatus for detecting a brief radiation signal in the presence of background radiation, which includes a plurality of radiation-sensitive devices arranged in a two-coordinate array and each operable to cause the storage of an elecrtric charge proportional to the radiant energy incident upon it, a like plurality of storage elements each associated with a separate radiation-sensitive device, a transfer arrangement operable to transfer repetitively any stored charge to its associated storage element to store a radiation image frame, register means having a number of storage locations equal to the number of radiation-sensitive devices and arranged in a similar two-coordinate array, a shift arrangement operable to shift repetitively the radiation image frame stored in the storage elements into the register means in a series of parallel bit streams defined by one of said two coordinates and simultaneously to shift out of the register means for preceding radiation image frame, detector means operable to compare the contents of corresponding bit positions in each bit stream shifted into and out of the register means simultaneously, so as to detect changes in the radiation incident upon the array and to deliver an output signal when such a change is detected, a sampling circuit responsive to the output of the detector means associated with each separate bit stream and comprising a threshold circuit operable to deliver a signal only when the output of the detector means applied thereto exceeds a threshold level and a control circuit actuated by an output from the threshold circuit to cause instantaneous samples to be taken of the outputs of the detector means associated with each bit stream, and output means responsive to the sampled outputs to define the position in the radiation image frame of each bit position producing an output from the detector means.

4,547,678
HYBRID ELECTRIC VEHICLE CONTROL METHODS AND DEVICES

Robert G. Metzner, Beverly Hills, and Stephen H. Smith, Playa del Rey, both of Calif., assignors to Califone International, Inc., Los Angeles, Calif.

Division of Ser. No. 111,260, Jan. 11, 1980, abandoned. This application Feb. 15, 1984, Ser. No. 579,795
Int. Cl.[4] B60L 11/14
U.S. Cl. 290—40 C 6 Claims



1. In a hybrid electric vehicle control system wherein the vehicle includes a heat engine adapted to deliver mechanical power to vehicle drive train means, a power leveling system for operating the heat engine at a constant power output substantially near its peak efficiency point comprising

a dynamo adapted to receive mechanical power from the heat engine and to generate electric power in response to a control signal,

electric power storage means for receiving electrical power from the dyanmo,

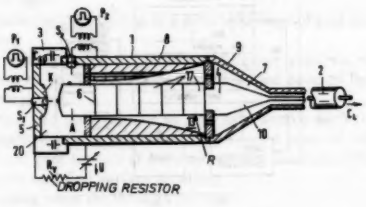
first means for determining the heat engine power requirement for said vehicle drive train means and for generating a first signal proportional thereto, and

second means responsive to the first means for generating the control signal and for adjusting the control signal to vary the electrical power generated by the dynamo inversely with respect to the heat and load requirement for the vehicle drive train means to substantially operate the heat engine at a constant output near its peak efficiency point.

4,547,679
GENERATOR FOR PRODUCING HIGH-VOLTAGE RECTANGULAR PULSES

Diethard Hansen, and Martin Wilhelm, both of Berlin, Fed. Rep. of Germany, assignors to Hahn-Meitner-Institut für Kernforschung Berlin GmbH, Berlin, Fed. Rep. of Germany

Filed Apr. 8, 1983, Ser. No. 483,348
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1982, 3216285
Int. Cl.[4] H03K 3/537
U.S. Cl. 307—108 17 Claims



1. A pulse generator for converting input power supplied from a DC source into rectangular high voltage pulses of output power to a coaxial cable, comprising inner and outer

conductors, leading to a load, said generator comprising a gas-filled tube comprising:

(a) an inner cylindrical body comprising series resistor elements from one end to the other to form a resistor, said inner cylindrical body having a first electrically conductive electrode at said one end and an inner conductor at said other end;

(b) an annular outer gas-filled envelope coaxial with and spaced from said inner body, said annular envelope having a base end at one end thereof spaced from said one end of said inner body and an annular outer conductor at the other end thereof surrounding said inner conductor at said other end of said inner body, said base end of said outer envelope including a second electrically conductive electrode spaced from said first electrode at said one end of said inner body;

(c) means for switching on a pulse comprising a first triggered switching discharge gap; and

(d) means for switching off a pulse comprising a second triggered switching discharge gap;

(e) said inner conductor at said other end of said inner body being tapered and gradually merging to and being connected to said inner conductor of said coaxial cable and said annular outer conductor at said other end of said outer envelope being tapered and gradually merging to and being connected to said outer conductor of said coaxial cable.

4,547,680

FLUID FLOW MACHINE WITH AN ELECTROMAGNETICALLY OPERATED DIAPHRAGM PUMP

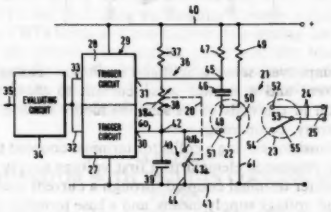
Friedrich Edler, Bammental, Fed. Rep. of Germany, assignor to Chemie Und Filter GmbH, Verfahrenstechnik KG, Heidelberg, Fed. Rep. of Germany

Filed Jan. 31, 1983, Ser. No. 462,373

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1982, 3204050

Int. Cl.⁴ F04B *49/00*

U.S. Cl. 307—141 **17 Claims**



1. A fluid flow machine, comprising a pump; electromagnet means for operating said pump; first and second energizing means activatable to energize said electromagnet means, said second energizing means comprising a timer circuit including resistor means and capacitor means in series with said resistor means, said capacitor means being chargeable via said resistor means to thereby energize said electromagnet means; means for activating said first energizing means, including coupling means having first and second coupling elements which are separable from each other to thereby deactivate said first energizing means; and means for blocking the activation of said second energizing means in response to connection of said coupling elements to each other, said blocking means including means for shunting said capacitor means in response to attachment of said coupling elements to one another.

4,547,681

SEMICONDUCTOR DEVICE HAVING CONTACTING BUT ELECTRICALLY ISOLATED REGIONS OF OPPOSITE CONDUCTIVITY TYPES

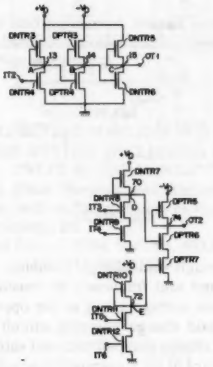
Hideharu Egawa, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 265,590, May 20, 1981,. This application Jun. 26, 1984, Ser. No. 624,815

Claims priority, application Japan, May 20, 1980, 55-66971; May 20, 1980, 55-66972

Int. Cl.⁴ H03L *1/00, 5/00;* H03K *17/14, 19/003*

U.S. Cl. 307—279 **11 Claims**



1. A semiconductor circuit comprising:

first, second and third power supply terminals which are respectively set at first, second and third voltage potentials of different levels said third voltage potential being at a level between the levels of said first and second voltage potentials;

a first semiconductor circuit section connected to said first power supply terminal for generating an output signal having a voltage potential level between said first voltage potential and said third voltage potential according to an input signal having a voltage potential level between said second and third voltage potentials; and

a second semiconductor circuit section connected to said second power supply terminal for generating an output signal having a voltage potential level between said second and third voltage potentials according to the output signal from said first semiconductor circuit section.

4,547,682

PRECISION REGULATION, FREQUENCY MODULATED SUBSTRATE VOLTAGE GENERATOR

John S. Bialas, Jr., Manassas; Richard J. Daniels, Dumfries, and William J. Mruk, Chantilly, all of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 27, 1983, Ser. No. 546,223

Int. Cl.⁴ H03B *5/24;* H03L *7/04*

U.S. Cl. 307—297 **3 Claims**

1. A substrate voltage generator circuit for an integrated circuit, comprising

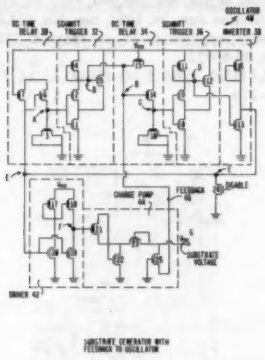
a variable frequency oscillator circuit having a control input node and an output node, for providing oscillatory signals at said output node;

a charge pumping circuit having an input connected to said output node of said oscillator and an output node connected to said substrate, for providing a charging current to said substrate;

a first FET device having its gate connected to reference potential and its source drain path connected between said output node of said charging pumping circuit and said

control input node of said oscillator, for providing a feedback signal to control the frequency of oscillation of said oscillator circuit in response to variations in the voltage of said substrate;

said frequency of oscillation increasing as said substrate voltage changes in a first direction, in order to pump more



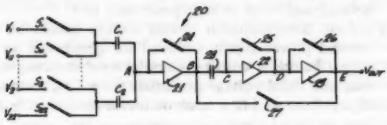
charge through said charge pumping circuit into said substrate, and said frequency decreasing in response to said substrate voltage going in the opposite direction in order for said charge pumping circuit to diminish the quantity of charge pumped into said substrate; whereby a precise control of the substrate voltage can be maintained.

4,547,683

HIGH SPEED CHARGE BALANCING COMPARATOR

David Bingham, San Jose, Calif., assignor to Intersil, Inc., Cupertino, Calif.

Filed Oct. 18, 1982, Ser. No. 434,893
Int. Cl.[4] H03K *5/22*
U.S. Cl. 307—355 **14 Claims**



1. A comparator for comparing two or more input voltages comprising:

an amplifier having an input node, at least one internal node, and an output node;

means for operating said amplifier in alternate autozero and compare phases in which said input, internal and output nodes are driven to respective autozero voltages during said autozero phase, and at least two input voltages are compared at said input node during said compare phase;

switch means having an open state and a closed state for coupling said output node to said internal node when closed; and

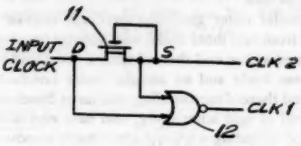
means for maintaining said switch means closed during said autozero phase and until a predetermined time after the commencement of said compare phase to maintain said amplifier internal node and output node at voltage levels close to their autozero values during said autozero phase and until a predetermined time after the commencement of said compare phase.

4,547,684

CLOCK GENERATOR

Henry Pechar, Bayville, N.Y., assignor to Standard Microsystems Corporation, Hauppauge, N.Y.

Filed Aug. 22, 1983, Ser. No. 525,286
Int. Cl.[4] H03K *5/15, 3/353, 19/094*
U.S. Cl. 307—481 **1 Claim**



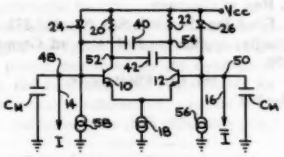
1. A clock generator for providing first and second nonoverlapping clocks comprising a clock input for receiving an input clock, a depletion-mode MOS device having an input terminal connected to said clock input and an output terminal connected to its gate, and a NOR gate having an output, a first input connected to the output terminal of said MOS device and a second input connected to said clock input, whereby the outputs of said MOS device and of said NOR gate are respectively said nonoverlapping first and second clocks.

4,547,685

SENSE AMPLIFIER CIRCUIT FOR SEMICONDUCTOR MEMORIES

Thomas S. W. Wong, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 21, 1983, Ser. No. 544,323
Int. Cl.[4] H03K *5/24, 3/356, 17/04*
U.S. Cl. 307—530 **6 Claims**



1. An improved sense amplifier circuit for sensing a first sense current and a second sense current to thereby sense information in the cells of an semiconductor random access memory array, comprising:

a first transistor having a collector terminal coupled through a first resistance element to a first voltage supply means, an emitter terminal coupled through a current source to a second voltage supply means, and a base terminal coupled to receive the first sense current;

a second transistor having a collector terminal coupled through a second resistance element to said first voltage supply means, an emitter terminal coupled to the emitter terminal of said first transistor, and a base terminal coupled to receive the second sense current;

a first means for biasing the base of said first transistor, said first means for biasing including a first diode element coupled to said first voltage supply means and further coupled at the base terminal of said first transistor to a first bias current source;

a second means for biasing the base of said second transistor said second means for biasing, including a second diode element coupled to said first voltage supply means and further coupled at the base terminal of said second transistor to a second bias current source; and

an AC-coupled positive feedback circuit which couples the

collector terminal of said second transistor to the base terminal of said first transistor and which further couples the collector terminal of said first transistor to the base terminal of said second transistor to apply a portion of the respective voltage signals on said respective collector terminals.

4,547,686

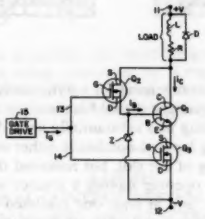
HYBRID POWER SEMICONDUCTOR SWITCH

Dan Y. Chen, Blacksburg, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 30, 1983, Ser. No. 537,614

Int. Cl.[4] H03K *17/08, 17/10*

U.S. Cl. 307—570 **11 Claims**



1. A switching circuit for an inductive load energized from a d-c source, said switching circuit comprising:

a bipolar transistor having first and second power electrodes and a control electrode;

a first field effect transistor (FET) having first and second power electrodes and a gate electrode;

means for connecting the power electrodes of the bipolar transistor and the first FET serially with the load cross the d-c source;

a second FET having first and second power electrodes and a gate electrode, said first and second power electrodes being connected between the first power electrode and the control electrode of the bipolar transistor;

gate drive means connected to the gate electrodes of both FETs and providing rectangular voltage pulses thereto, the FETs being in a conductive state during the existence of any positive rectangular pulse whereby load current passes through the load, the bipolar transistor and the first FET, the second FET applying a control signal to the control electrode of the bipolar transistor.

4,547,687

MICROMOTOR WITH BUILT-IN COOLING MEDIUM PIPES

Eiichi Arai, Kyoto, Japan, assignor to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Continuation of Ser. No. 429,118, Sep. 30, 1982,. This application Nov. 21, 1984, Ser. No. 674,472

Claims priority, application Japan, Oct. 12, 1981, 56-151108[U]

Int. Cl.[4] H02K *9/00*

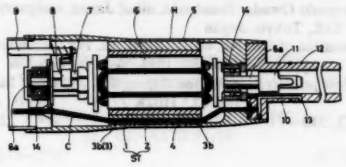
U.S. Cl. 310—58 **1 Claim**

1. A micromotor with built-in cooling medium pipes provided in a handpiece body comprising:

a stator of said micromotor comprising a cylindrical permanent rare earth cobalt magnet diametrically magnitized;

a yoke of a soft magnetic material encircling the whole of the outer periphery of said cylindrical rare earth cobalt permanent magnet and being in contact therewith;

said micromotor being characterized in that the micromotor comprises a pair of receptor portions in the form of notched grooves disposed in the outer circumference of said yoke in opposed relationship with each other on the diametrical line of said permanent magnet, each of said pair of receptor portions being provided adjacent a magnetic pole of said permanent magnet and at least one of said cooling medium pipes extending through at least one of said receptor portions.



4,547,688

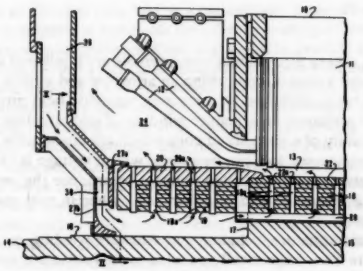
DYNAMOELECTRIC MACHINE WITH ROTOR VENTILATION SYSTEM INCLUDING PREWHIRL INLET GUIDE VANES

Joel B. Hammer, Plum Borough, and Richard A. Gronholm, East Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 7, 1984, Ser. No. 607,854

Int. Cl.[4] H02K *9/00*

U.S. Cl. 310—59 **4 Claims**



1. A dynamoelectric machine comprising:

a stator with a core and coil windings having end turns extending axially beyond ends of said core;

a rotor centrally disposed on a shaft for rotation in a given direction within said stator with an air gap therebetween;

said rotor comprising a body portion with axially opposing end faces, said body portion having a plurality of axially extending coil slots with coils located therein and coil end turns extending axially beyond each end of said rotor body portion;

said coil slots also each having a coolant channel extending axially therethrough under said coils, said coils having radial coolant passages communicating with said coolant channel and said air gap, said end turns also having radial coolant passages;

a stationary coolant inlet duct for supplying a coolant gas to the radially lower side of said end turns and to said axial coolant channels; and

said coolant inlet duct having a first wall adjacent the axial extremity of said end turns and a second wall spaced axially outward from said first wall and extending to a location proximate said shaft, said coolant inlet duct having therein means for rotationally directing coolant out of said duct in the direction of rotation of said rotor, said means for rotationally directing coolant comprising a plurality of inlet guide vanes in fixed locations between said first and second walls of said inlet duct.

4,547,689

ROTARY ELECTRIC MACHINE OPERABLE WITH CHANGEABLE RATED VOLTAGE

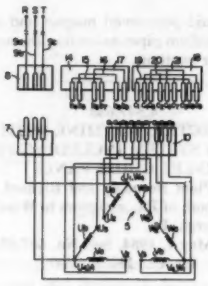
Hiroshi Tsuchimoto, Ichikawa; Yasuro Suzuki, Narashino, and Takeyoshi Owada, Funabashi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 401,022, Jul. 22, 1982, abandoned. This application Jul. 31, 1984, Ser. No. 636,356

Claims priority, application Japan, Jul. 24, 1981, 56-115044

Int. Cl.[4] H02K *11/00*

U.S. Cl. 310—71 28 Claims



1. A rotary electric machine operable with selected one of two rated voltages, comprising an armature and a rotor rotating by being energized by a rotating magnetic field produced by said armature, an armature winding of said armature being an assembly of a plurality of coils which are changeably selectively connected to a power source whose voltage is changeable between said two rated voltages to produce the required rotating magnetic field in either case, wherein said machine comprises:

(a) said armature including said armature winding, an armature core magnetically coupled to said armature winding and a casing supporting said armature core and said armature winding;

(b) each of said coils having a connection terminal at at least one end thereof;

(c) part of said connection terminals being used as power input terminals which are connected to the power supply terminals of said power source regardless of change-over of the rated voltage, and at least part of said connection terminals being used as connection changing terminals the connections among which are changeable such that said coils can produce the required rotating magnetic field when the rated voltage is changed over;

(d) connection terminal holding means fixed to said casing to hold said connection changing terminals in a relation electrically insulated from one another;

(e) a plurality of jumper conductors provided for selectively connecting said connection changing terminals with each other;

(f) jumper conductor holding means holding said jumper conductors in a relation electrically insulated from one another, and detachably coupled to said connection terminal holding means so as to disconnectably electrically connect said jumper conductors to said connection changing terminals; and

(g) lead wires electrically connecting said power input terminals to said power supply terminals without passing through said connection terminal holding means and said jumper conductor holding means.

4,547,690

FLEXIBLE STATOR SLOT CLOSURE ARRANGEMENT

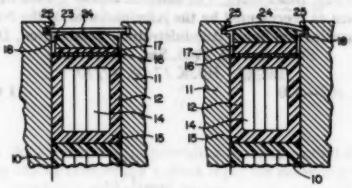
Duncan T. Bath, and James H. Ferguson, both of Peterborough, Canada, assignors to Canadian General Electric Co., Ltd., Toronto, Canada

Filed Feb. 15, 1984, Ser. No. 580,315

Claims priority, application Canada, Dec. 21, 1983, 443885

Int. Cl.[4] H02K *3/48*

U.S. Cl. 310—214 6 Claims



1. A slot closure arrangement for a dynamoelectric machine having a core comprising a stack of laminations in which slots are provided extending in a substantially axial direction, each slot having opposing tapered notches in either side of said slot adjacent the opening of the slot, but removed therefrom, said notches defining an opening having a greater width than the opening of said slot, and at least one insulated conductor installed in said slot, said slot closure arrangement comprising:

a flat spring member having a width dimension greater than the width dimension of said slot but less than the width dimension of said slot at said opposed notches and having side edges each terminating in one of said opposing notches of said slot and extending across said slot opening with an outer exposed surface and an inner surface, and

longitudinally driven wedge means between said inner surface of said spring member and said conductor, said wedge means having an axially extending central portion on the surface thereof adjacent said inner surface of said spring member of greater thickness than the side edges of said wedge for causing an outward deformation of said flat spring member when driven between said conductor and said flat spring member so that said spring member has a center portion thereof bearing upon a mating surface of said wedge and the side edges of said spring bearing upon opposed tapered surfaces of said opposing notches to provide a spring force inwardly for retaining said conductor, said deformed spring member continuing to provide an inwardly compressive force between the tapered inner surfaces of said opposed notches and the surface of said wedge adjacent said inner surface as said wedge member and other members within said slot are compressed with time, temperature and usage.

4,547,691

PIEZOELECTRIC PRESSURE AND/OR TEMPERATURE TRANSDUCER

Michel Valdois, Cachan; Pierre Maitre, Pirey par Miserey; Raymond Besson, and Jean-Jacques Boy, both of Besancon, all of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Aug. 4, 1983, Ser. No. 520,289

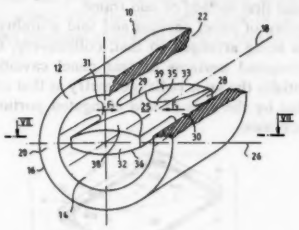
Claims priority, application France, Aug. 5, 1982, 82 13746

Int. Cl.[4] H01L *41/08*

U.S. Cl. 310—361 17 Claims

1. Piezoelectric transducer, notably for pressure and/or temperature of the type comprising a block of piezoelectric material having an external element (12) sensitive to a pressure and notably to a pressure to be measured and at least one internal element (25) capable of vibrating under the action of an electric stress, the internal element normally not being subjected to the direct action of said pressure and connected to

the external element to receive forces corresponding to this pressure, characterized in that the external element (12) has a tubular form designed to receive the pressure on its external face (16) and the internal element is in the form of a plate (25) placed in the tubular element in a plane substantially parallel to



its longitudinal direction, the opposite longitudinal edges of this plate each being connected by a respective connecting element (30, 31) to the internal face of the tubular element (16) for the transmission of said forces to the plate in a transverse direction.

4,547,692

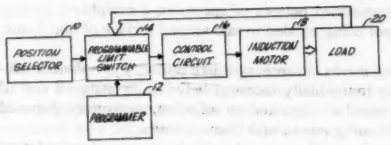
POSITIONAL CONTROL SYSTEM EMPLOYING INDUCTION MOTOR AND ELECTRONIC BRAKING THEREOF

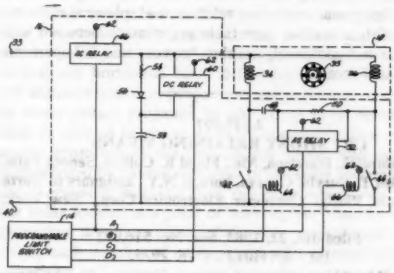
Carl P. Spaulding, 275 N. Halstead, Pasadena, Calif. 91107

Filed Oct. 7, 1983, Ser. No. 540,199

Int. Cl.[4] G05B *19/00*

U.S. Cl. 318—592 **17 Claims**





1. A positional control system comprising:
a movable load to be positioned;
means for sensing the position of the load;
an induction motor coupled to the load to move the load as the motor operates, the induction motor having two or more stator windings;
means for applying alternating current power to the stator windings to energize the motor;
means for storing direct current electrical energy;
means responsive to the position sensing means for disabling the applying means as the motor approaches a predetermined load position; and
means responsive to the position sensing means for connecting the storing means, to the motor as the motor approaches more closely to the predetermined load position to apply direct current to the stator windings, and to stop the motor at the predetermined load position.

4,547,693

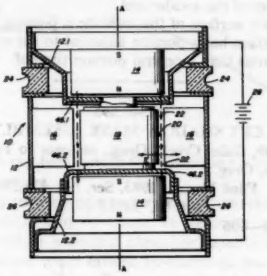
RE-ENTRANT CATHODE SUPPORT

John Burr, Wenham, Mass., assignor to M/A Com, Inc., Burlington, Mass.

Filed May 25, 1983, Ser. No. 497,757

Int. Cl.[4] A47B *51/00*

U.S. Cl. 313—270 **22 Claims**



1. In an electron tube having a cathode and an anode one of which substantially surrounds the other providing an electron-interaction space between them and means to provide a magnetic field having a substantial component oriented in the axial direction traversing said interaction space, a cathode structure of reduced axial dimension for permitting the length of said magnetic field component to be minimized comprising a substantially tubular cathode and first axially-oriented support means adjacent to and substantially throughout its axial length spaced away from said cathode, means to attach a first axial end of said support means to a first axial end of said cathode, the second end of said support means extending axially beyond the second axial end of said cathode for fixing said cathode to a first location in said electron tube.

4,547,694

LOW-LOSS CATHODE FOR A TELEVISION CAMERA TUBE

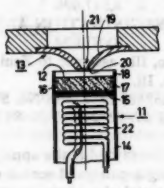
Erich E. Himmelbauer, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 12, 1982, Ser. No. 441,183

Claims priority, application Netherlands, Dec. 31, 1981, 8105921

Int. Cl.[4] H01J *1/28, 29/04, 31/38*

U.S. Cl. 313—384 **11 Claims**



1. A television camera tube comprising:
an evacuated envelope having an axis and first and second opposite ends;
a photosensitive target at the first end of the envelope;

a cathode arranged toward the second end of the envelope opposite the first end, said cathode having an emissive surface centered on and extending substantially perpendicular to the axis;

an anode arranged between the cathode and the target, said anode having a central aperture around the axis; and

a focusing lens arranged between the anode and the target for focusing an electron beam from the cathode and anode onto the target;

characterized in that:

the camera tube further comprises an electrically conductive collar arranged around the emissive surface of the cathode, said collar extending from the emissive surface substantially parallel to the axis at least 40 microns in the direction of the anode; and

the emissive surface of the cathode is porous, and the emissive surface has a portion adjacent to the collar which is less porous than a central portion thereof.

4,547,695

CRT SHADOW MASK ASSEMBLY

Dale R. Rath, Gales Creek, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Mar. 3, 1983, Ser. No. 471,588
Int. Cl.[4] H01J *29/07*
U.S. Cl. 313—406 **10 Claims**

1. A shadow mask assembly for a cathode-ray tube comprising a closed frame and a shadow mask membrane attached to the frame in a taut condition whereby an inwardly directed bending force is exerted on the frame, characterized by

a rigid strip of material forming the main body of the frame, the membrane being affixed to one edge of the strip, said strip being angled from said one edge inwardly toward the other edge whereby said bending force is partially directed to compress the strip,

said strip including an outwardly directed first flange formed at said one edge, the membrane being attached to said first flange, and a second outwardly directed flange formed at said second edge, said flanges enhancing the rigidity of the strip to resist bending.

4,547,696

TENSION MASK REGISTRATION AND SUPPORTING SYSTEM

Paul Strauss, Chicago, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jan. 18, 1984, Ser. No. 572,088
Int. Cl.[4] H01J *29/02, 29/07, 29/86;* B05D *5/06*
U.S. Cl. 313—407 **24 Claims**

1. In a color cathode ray tube, the apparatus comprising:

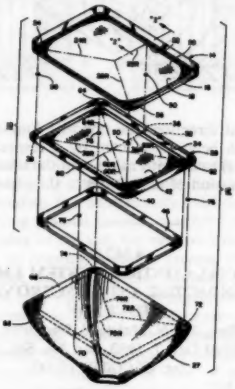
a glass panel having a patterned screen of luminescent primary color elemental phosphor deposits,

said panel further including registration-affording means defining a first plurality of cavities, each cavity comprising an elongated, substantially radially aligned portion formed at a selected peripheral location upon the screen side of said panel;

a frame defining a central opening dimensioned to enclose said screen of said panel and comprising first and second spaced-apart surfaces;

said frame further including registration-affording means defining a second like plurality of cavities, each cavity also comprising an elongated, substantially radially aligned portion formed at a selected peripheral location upon said first surface of said frame,

said plurality of panel cavities and said plurality of frame cavities being arranged so that, collectively, the axes if said elongated portions of said panel caviaties exhibit substantially the same radial geometry as that collectively exhibited by the axes of said elongated portions of said frame cavities;



a color selection electrode comprising a tensed foil having a predetermined pattern of apertures, a peripheral portion thereof being bonded to said second surface of said frame; and

indexing means comprising a like plurality of spherical elements individually received between an assigned one of said panel cavities and an adjacent, oppositely disposed confronting one of said frame cavities,

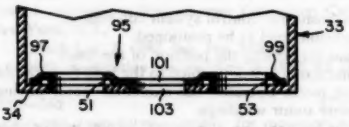
so that, when said panel and frame cavities are disposed in an overlying near coincident relation, said spherical elements establish a precise repeatable registration between said frame and said panel, and thus between said foil apertures and said screen.

4,547,697

CRT SHUNT RETAINING MEANS

Glen A. Burdick, Harrison, Me.; Floyd K. Collins, Seneca Falls, and Alan T. Kuryla, Geneva, both of N.Y., assignors to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Jul. 22, 1983, Ser. No. 516,022
Int. Cl.[4] H01J *29/76, 29/51*
U.S. Cl. 313—412 **3 Claims**



1. An improvement in a color cathode ray tube employing an assembly of three in-line electron guns emitting a center and two side electron beams in a common plane from three in-line apertures in a terminally positioned convergence cup, said cup having an apertured magnetic shunt associated with at least

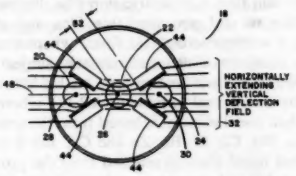
one of said side apertures, said shunt is captivated by apertured retaining means, said means having a shunt-accommodating pocket defined by a substantial planar apertured top portion and a sidewall portion, the pocket surrounded by a peripheral seating rim affixed to the bottom of the convergence cup in position to align the apertures of the cup, shunt and retaining means, the sidewall portion having a plurality of spaced-apart indentations which abut the peripheral edge of the shunt, to thereby effect apertural alignment of the shunt and the convergence cup.

4,547,698

MAGNETIC DEFLECTION FIELD ENHANCER MEANS FOR TELEVISION CRT ELECTRON GUNS

Norman F. Gioia, and Fred H. Seher, both of Lombard, Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Sep. 29, 1980, Ser. No. 191,581
Int. Cl.[4] H01J *29/50*
U.S. Cl. 313—414 1 Claim



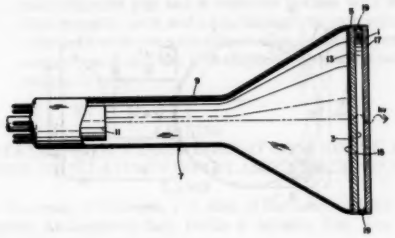
1. An in-line electron gun for use in a color television cathode ray tube having a viewing screen, said gun generating three coplanar electron beams consisting of a center beam coincident with the tube axis, and two adjacent off-axis beams, said beams passing through, respectively, a center aperture and two off-axis apertures in a shield cup electrode of said gun to enter a beam deflection region having horizontally and vertically extending magnetic flux paths providing for respective vertical and horizontal beam deflection fields for deflecting said beams in unison to project a raster pattern on said screen, the raster pattern projected by said center beam being diminished in vertical height so as to be non-coextensive with the pattern projected by the two off-axis beams, said gun being characterized by having two pairs of inwardly converging but non-intersecting magnetic field enhancer means, one of each pair being located at a point of beam egress from the gun and embracing in symmetrical relationship one of said off-axis beams, each member of each of said pairs of enhancer means comprising an L-shaped bracket with said brackets defining an opening therebetween, one leg of each bracket providing for attachment to said electrode, with each bracket being oriented at a predetermined convergence angle in the range of 5° to 60° with respect to the plane of the three beam paths, and located at a predetermined distance in the range of (a) tangential to said center aperture to (b), as far as 0.30 inch from said center beam, said brackets, said predetermined angle and distance, and the separation and length of said brackets being such that the enhancer means is effective to divert the flux of said vertical deflection field through the openings between the enhancer means onto said center beam to enhance the vertical height of the raster pattern of said center beam into coextensiveness with the raster patterns projected by said off-axis beams.

4,547,699

GREEN LUMINESCING CATHODE-RAY TUBE DEVICE

Brian J. Fitzpatrick, Ossining, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Dec. 27, 1982, Ser. No. 453,379
Int. Cl.[4] H01J *29/18, 5/16, 31/00*
U.S. Cl. 313—478 15 Claims



1. A cathode-ray tube device for generating a bright green light spot comprising:

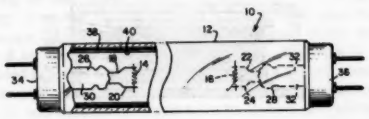
a cathode-ray tube including an evacuated envelope, means, located within said envelope, to generate an electron beam, a terbium activated phosphor capable of emitting green radiation when excited by electrons and positioned within said envelope and in the path of said electron beam and a transparent face plate forming part of said envelope and situated in the path of said green radiation, and positioned outside of the outer surface of said face plate and in the path of said green radiation, a light filtering means comprising, a container at least the portion of which in the path of said green radiation is transparent to said radiation, said filtering means further comprising a concentrated solution of a soluble praseodymium salt.

4,547,700

FLUORESCENT LAMP WITH HOMOGENEOUS DISPERSION OF ALUMINA PARTICLES IN PHOSPHOR LAYER

Geraldine A. Landry, Rowley, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Feb. 23, 1984, Ser. No. 582,676
Int. Cl.[4] H01J *61/46, 61/44*
U.S. Cl. 313—487 3 Claims



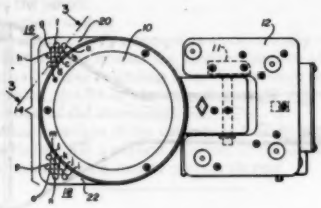
1. In a fluorescent lamp having a light transmissive glass envelope containing an arc generating and sustaining medium including mercury and having electrodes sealed into the ends thereof, said envelope having on its interior a first layer of a substantially broad-band emitting phosphor and a second layer of phosphor comprised of a mixture of three substantially narrow band emitting phosphors, the improvement comprising: said second layer of said phosphor including a substantially homogeneous dispersion of sub-micron size particles of alumina in an amount of from about 6 to about 50 percent by weight of said second phosphor layer.

4,547,701

IR LIGHT FOR USE WITH NIGHT VISION GOGGLES

Robert R. Taylor, Fort Worth; Billy C. Bowen, Fuless, and John H. Emery, Fort Worth, all of Tex., assignors to Bell Helicopter Textron Inc., Fort Worth, Tex.

Filed Jul. 1, 1983, Ser. No. 510,208
Int. Cl.⁴ H01J 1/62
U.S. Cl. 313—500 3 Claims



1. An IR source of illumination for use with night vision goggles comprising:

an array of a minimum of about eight Ga-Al-As diodes in planar distribution with the spacing of the diodes within said group such that a minimum of about 75% of the diodes provide coupling in the light pattern to at least two other diodes in the array to enhance the output thereof; and

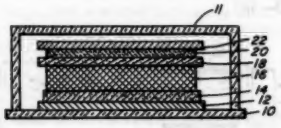
means to operate said diodes in parallel at about the current limit of the diodes.

4,547,702

THIN FILM ELECTROLUMINSCENT DISPLAY DEVICE

Martin P. Schrank, Ipswich, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Oct. 11, 1983, Ser. No. 540,222
Int. Cl.⁴ H05B 33/22
U.S. Cl. 313—509 11 Claims



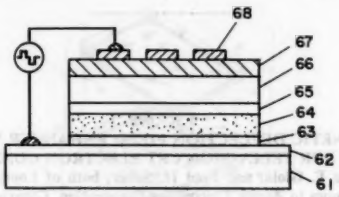
1. An electroluminescent display device comprising a transparent electrode layer, a segmented electrode layer, an electroluminescent phosphor layer disposed between said electrode layers, and a dark field layer of a composition of a dielectric material with a noble metal, wherein the percentage of noble metal by volume is in the range of 6%–10%, said dark field layer being interposed between said electroluminescent phosphor layer and said segmented electrode layer, said dark field layer having a film thickness in the range of about 5,000 to about 9,000 Angstroms, said noble metal controlling the opacity and operating temperature of said dark field layer.

4,547,703

THIN FILM ELECTROLUMINESCENT ELEMENT

Yosuke Fujita, Ashiya; Takao Tohda, Ikoma; Tomizo Matsuoka, Neyagawa; Atsushi Abe, Ikoma, and Tsuneharu Nitta, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

PCT No. PCT/JP83/00164, § 371 Date Jan. 26, 1984, § 102(e) Date Jan. 26, 1984, PCT Pub. No. WO83/04339, PCT Pub. Date Dec. 8, 1983
PCT Filed [illegible]o, 1983, Ser. No. 576,394
Claims priority, application Japan, May 28, 1982, 57-91594; Jun. 3, 1982, 57-95430
Int. Cl.⁴ H05B 33/12
U.S. Cl. 313—509 11 Claims



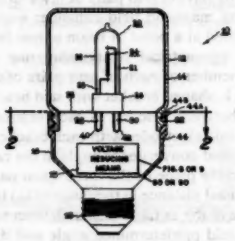
1. A thin film electroluminescent element comprising a phosphor thin film, a dielectric thin film disposed on at least one surface of said phosphor thin film, and electrodes for applying a voltage across said films, wherein said dielectric thin film comprises a dielectric material subject to dielectric breakdown of the self-healing type having a composition expressed by the general formula of AB_2O_6, where A is at least one divalent metal element selected from the group consisting of Pb, Sn, Mg, Ca, Sr, Ba, Zn and Cd, and B is at least one pentavalent metal element selected from the group consisting of Ta and Nb, wherein the product E_b-ϵ_γ of the dielectric breakdown electric field intensity E_b and dielectric constant ϵ_γ for the dielectric thin film is greater than or equal to 80×10^6 V/cm.

4,547,704

HIGHER EFFICIENCY INCANDESCENT LIGHTING UNITS

Walter K. Brinn, Shaker Hts.; Ivan Berlec, South Euclid; John M. Davenport, Lyndhurst; Milan R. Vukcevich, Burton, and Elmer G. Fridrich, Chardon, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 1, 1983, Ser. No. 519,162
Int. Cl.⁴ H01J 7/44
U.S. Cl. 315—71 10 Claims



1. A general service incandescent lighting unit comprising:

(a) a base having an electrically conductive screw-in section;

(b) an outer envelope mounted on said base;

(c) an inner envelope coaxially disposed within said outer

envelope and containing a halogen gas atmosphere along with a high pressure fill-gas;

(d) a filament coaxially disposed within said inner envelope;

(e) an infrared reflecting film coating the inner surface of said outer envelope and effective during the operation of said lighting unit for substantially transmitting visible radiation and substantially reflecting toward said filament infrared radiation emitted by said filament, and;

(f) voltage reducing means located in said base having means responsive to a predetermined phase angle of a voltage having a value of about 115 volts A.C. and being effective during the operation of said lamp for developing and applying a voltage having a value determined by said phase angle within the range of about 20 to less than about 90 volts A.C. or D.C. across said filament;

said outer envelope having means for connecting to said base which has means for complementary acceptance of said outer envelope, said means for connecting being designed in such a manner so as to be detachable from said base without causing damage to either of said base, said outer envelope or to electrical connections between said voltage reducing means and said filament.

4,547,705

DISCHARGE LAMP LIGHTENING DEVICE

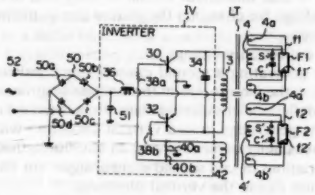
Hiromitsu Hirayama, and Hisashi Ebina, both of Tokyo, Japan, assignors to TDK Corporation, Tokyo, Japan

Filed Jan. 27, 1983, Ser. No. 461,518

Claims priority, application Japan, Aug. 28, 1982, 57-149590; Sep. 2, 1982, 57-40177; Nov. 1, 1982, 57-190871

Int. Cl.⁴ H05B *37/02, 39/04, 41/36*

U.S. Cl. 315—219 **10 Claims**



1. A discharge lamp lightening device for operating two discharge lamps such that at least one of said lamps can be lightened even when the other of the lamps is removed, comprising an inverter circuit for switching power supply current, and a leakage transformer which is supplied current by said inverter circuit and provides output voltage to the discharge lamps:

CHARACTERIZED IN THAT

said leakage transformer comprises;

a magnetic core,

a primary winding wound around said core and coupled with said inverter circuit,

a pair of secondary windings each coupled directly with a related discharge lamp,

filament windings coupled with filaments of related discharge lamps,

said magnetic core being a closed magnetic core with at least a pair of legs which bridge said closed magnetic core, each of said legs having a non-magnetic gap between the end of the leg and said closed magnetic core, a first window defined between said pair of legs, second and a third windows defined by one of said legs and a part of said closed magnetic core, said primary winding being located in the first window and being coupled with an inverter circuit, said first secondary winding being located in the second window and being coupled with a first one of said discharge lamps, said second secondary winding being located in the third window and being coupled with a second one of said discharge lamps;

said magnetic core having a first magnetic path which interlinks with said primary winding and both of said secondary windings; second and a third magnetic paths each of which interlinks with the primary winding and a respective one of the secondary windings, said second and third magnetic paths each having a non-magnetic gap and a common portion with the first magnetic path; and a fourth magnetic path which interlinks with the primary winding and has a common portion with the first magnetic path and a non-magnetic gap.

4,547,706

INVERTER WITH A LOAD CIRCUIT CONTAINING A SERIES OSCILLATING CIRCUIT AND A DISCHARGE LAMP

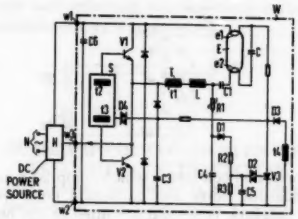
Peter Krummel, St. Georgen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 15, 1983, Ser. No. 561,675

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1982, 3246454

Int. Cl.⁴ H05B *37/02*

U.S. Cl. 315—226 **6 Claims**



1. An inverter, comprising: alternately conductive, controllable first and second switches; a load circuit connected parallel to the first switch; the first and second switches being connected in series across a dc voltage source; the load circuit comprising a series connection of an oscillating circuit choke, a coupling capacitor, and a parallel connection of a discharge lamp and an oscillating circuit capacitor, the discharge lamp having first and second heatable electrodes to which the oscillating circuit capacitor is connected; a firing unit means for alternately opening and closing the first and second switches; the oscillating circuit choke and oscillating circuit capacitor forming an oscillating circuit having a given resonant frequency when the discharge lamp is not ignited, said resonant frequency lying below an operating frequency of the inverter defined by the firing unit; a voltage-dependent resistor being provided in series with a capacitor to form a branch connected to said oscillating circuit, said branch being connected at a point in said oscillating circuit so as to change said given resonant frequency of said oscillating circuit when a voltage present across the voltage-dependent resistor rises and the voltage-dependent resistor enters its active conducting region.

4,547,707

DEFLECTION YOKE APPARATUS

Koji Yabase, Urawa, Japan, assignor to Denki Onkyo Company Limited, Tokyo, Japan

Filed Jun. 1, 1983, Ser. No. 499,840

Claims priority, application Japan, Jun. 1, 1982, 57-93794

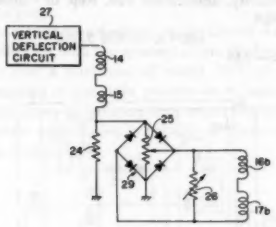
Int. Cl.⁴ H01J *29/70, 29/76*

U.S. Cl. 315—368 **6 Claims**

1. A deflection yoke apparatus which is mounted on a neck

of a cathode ray tube in which three electron guns are arranged in-line and rasters are produced on a screen by electron beams emitted from said electron guns, comprising:

(a) a deflection yoke which comprises a pair of saddle type horizontal deflection coils which have rear rise parts and generate a pincushion type horizontal deflection magnetic field, a coil separator which has a bulged part for fixing said coils inside the coil separator and housing said rear parts, a pair of vertical deflection coils which are arranged outside said coil separator and generate a barrel type vertical deflection magnetic field, and an annular deflection core which forms a part of a magnetic path of magnetic flux generated from said both coils and is constructed so that misconvergence X_H at both ends of the horizontal axis X of the screen is eliminated to approximately zero and a cross misconvergence PQ_V at the end parts in the diagonal direction of screen is eliminated to approximately zero, thereby a remaining misconvergence being intensively provided as the amount Y_H in the horizontal direction at the upper and lower end parts in the vertical axis direction Y of the screen, when three beams are deflected by said deflection magnetic field;



(b) a pair of correction coil means which comprise a pair of U-shaped magnetic cores and correction coils wound around said magnetic cores and are fitted to the bulged part of said coil separator to generate a correction magnetic field in the neck of said cathode-ray tube and dynamically converging said electron beams over the full range of the screen;

(c) a correction current source comprising a rectifying circuit which produces a non-modulated parabolic correction current synchronized with the vertical deflection current;

(d) a variable voltage divider being connected in parallel with said correction current source and adjusting a waveform of said correction current flowing in said correction coil;

(e) a circuit means for forming an adjustable resistor circuit respectively connected in parallel with two diodes of said rectifying circuit and supplying the correction current of the correction current source to the correction coils, thereby adjusting the tilt of the electron beam arrangement against the horizontal axis X; and

(f) a correction current adjusting means for adjusting the correction current flowing in said correction coil, thereby adjusting the amount of the correction current.

4,547,708

VARIABLE PICTURE SIZE CIRCUIT FOR A TELEVISION RECEIVER

Peter E. Haferl, Adliswil, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Sep. 22, 1983, Ser. No. 534,711

Claims priority, application United Kingdom, Feb. 27, 1983, 8304754

Int. Cl.⁴ H01J *29/56*

U.S. Cl. 315—371 **11 Claims**

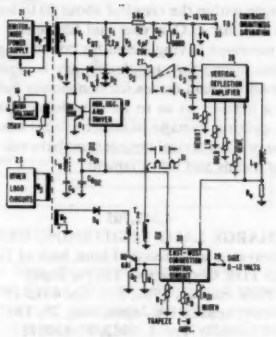
1. A picture size control circuit for a television raster display system comprising:

a horizontal deflection winding;

a horizontal deflection circuit for periodically applying a horizontal trace voltage to said horizontal deflection winding to generate horizontal scanning current therein;

a modulator circuit responsive to control signals for varying said horizontal trace voltage to develop concurrent variations in the amplitude of said horizontal scanning current;

means for generating a side pincushion control signal that is applied to said modulator circuit to vary said horizontal trace voltage at a vertical rate for developing variations in the amplitude of said horizontal scanning current that produce side pincushion correction;



means for generating a horizontal size control signal that is applied to said modulator circuit to vary said horizontal trace voltage for changing the picture size in the horizontal direction;

a vertical deflection winding;

means for generating a second control signal indicative of changes in the picture size in the horizontal direction; and

a vertical deflection circuit responsive to said second control signal for generating in said vertical deflection winding a vertical scanning current having an amplitude that varies with variations in said second control signal for changing the picture size in the vertical direction.

4,547,709

CATHODE RAY TUBE DISPLAY DEVICE

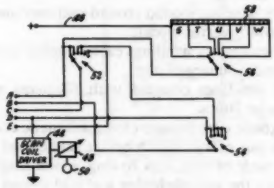
Jack G. French, Lowestoft, England, assignor to Mars, Incorporated, McLean, Va.

Filed Dec. 29, 1981, Ser. No. 335,365

Claims priority, application United Kingdom, Dec. 31, 1980, 8041526

Int. Cl.⁴ H01J *29/78*

U.S. Cl. 315—378 **12 Claims**



1. A cathode ray tube display device of the type in which a display is formed by repeated radially outward deflections of a beam at a constant speed, the deflections being successively angularly displaced relative to each other, the device having beam deflection coils and means for applying to inductive means which includes the beam deflection coils a voltage for causing a ramp current to flow in the coils to produce progres-

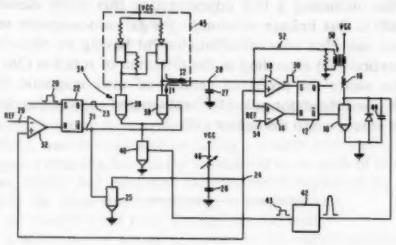
sive beam deflection, comprising means for changing the scale of the display, said scale changing means being selectively operable by an operator to change the interconnections of the deflection coils included in the inductance presented to the voltage applying means and thereby change the gradient of the ramp current, whereby different constant radially outward speeds of beam deflection may be selected and thus the scale of the display may be set to different values.

4,547,710

CATHODE RAY TUBE DISPLAY HORIZONTAL DEFLECTION SYSTEM WITH DELAY COMPENSATION

Paul W. Bond, and James D. Rockrohr, both of Kingston, N.Y., assignors to International Business Corporation, Armonk, N.Y.

Filed Jan. 26, 1983, Ser. No. 461,076
Int. Cl.[4] H01J *29/70, 29/76*
U.S. Cl. 315—403 **5 Claims**



1. An off-drive pulse generation circuit for terminating the drive pulse to a deflection coil of a cathode ray display tube in response to a synchronizing pulse to thereby initiate a flyback interval in the tube comprising:

(a) sawtooth generation means which generates a fixed length sawtooth voltage initiated by the occurrence of said synchronization pulse

(b) means responsive to said flyback interval to generate an electrical representation thereof

(c) comparison means responsive to the time of occurrence of said electrical representation relative to the termination of said sawtooth voltage for producing an electrical analog thereof, and

(d) pulse generating means responsive to the magnitude of the electrical analog to generate an off-drive pulse which can be either advanced or retarded with respect to a predetermined timed relationship relative to said synchronization pulse to advance or retard the initiation of said flyback interval wherein said pulse generating means includes means comparing the magnitude of said electrical analog relative to said potential of said sawtooth and initiating said off-drive pulse when the potential of said sawtooth first exceeds the magnitude of said electrical analog.

4,547,711

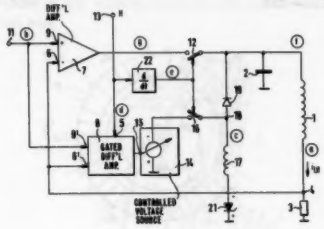
METHOD AND APPARATUS FOR PRODUCING SAWTOOTH WAVE DEFLECTION CURRENT FOR TELEVISION APPARATUS

Rainer Gehrmann, Alsbach-Hähnlein, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 14, 1984, Ser. No. 609,735
Claims priority, application Fed. Rep. of Germany, May 13, 1983, 3317465
Int. Cl.[4] H01J *29/70, 29/76*
U.S. Cl. 315—408 **5 Claims**

1. Method of generating a sawtooth current wave in the horizontal deflection coil of a television apparatus equipped with current regulation for linearizing the current during the forward trace sweep and with a deflection circuit configuration providing for free flyback during the retrace, comprising the steps of:

dynamically storing energy in an auxiliary coil (17) by putting a regulated current therethrough during the entire duration of the forward trace sweep;



during substantially the first part (t_3) of the retrace interval, leading both the current flowing in said auxiliary coil and the current flowing in said deflection coil into electrostatic energy storage means (2), and

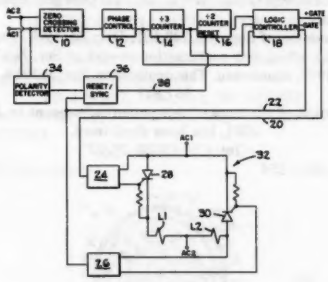
during the remainder of the retrace period, discharging through said deflection coil the energy collected in said electrostatic energy storage means.

4,547,712

SUBHARMONIC CONTROLLER FOR ELECTROMAGNETIC EXCITER

John D. Gotal, Indiana, and Junius D. Scott, Homer City, both of Pa., assignors to FMC Corporation, Chicago, Ill.

Filed May 4, 1983, Ser. No. 491,481
Int. Cl.[4] H02K *33/14*
U.S. Cl. 318—128 **10 Claims**



1. Controller for an electomagnetic exciter operating from a single phase alternating current source, comprising:

first and second electromagnet coils;

first and second thyristors, connected in series with said first and second coils respectively, each thyristor of opposite polarity from the other;

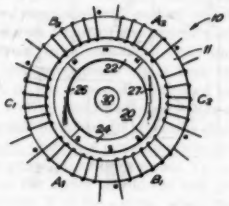
control circuit means for producing a first plus and a second minus gate signal; and

optoelectronic means for isolating said first thyristor from said first plus gate signal and isolating said second thyristors from said second minus gate signal, said optoelectronic means for activating said first and second thyristors only in response to said plus and minus gate signals respectively.

4,547,713
TOROIDALLY WOUND BRUSHLESS DC MOTOR

Lawrence W. Langley, and Robert L. Fisher, both of Christiansburg, Va., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Nov. 5, 1982, Ser. No. 439,553
Int. Cl.[4] H02K *21/14, 29/02*
U.S. Cl. 318—254 7 Claims

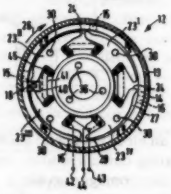


1. In a high speed electric motor, the combination of:
a magnetic stator core,
in the shape of ring without winding slots
made from alloy magnetic material having flux density (B sat) above 0.3 Tesla, a resistivity above 40 uohm-cm, and a core loss below 0.30 watts/kg's;
a rotor movable relative to said core, said rotor including at least one rare earth permanent magnet;
a stator winding located in the air gap between said rotor and said stator core;
a Hall device position detector for indicating the position of said permanent magnet; and
means coupled to said position detector for energizing said winding to provide a rotating magnetic field.

4,547,714
LOW MAGNETIC LEAKAGE FLUX BRUSHLESS PULSE CONTROLLED D-C MOTOR

Rolf Müller, St. Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Continuation of Ser. No. 220,181, Dec. 23, 1980, Pat. No. 4,429,263, which is a continuation-in-part of Ser. No. 60,879, Jul. 26, 1979, abandoned. This application Jan. 3, 1984, Ser. No. 567,527
The portion of the term of this patent subsequent to Jan. 31, 2001, has been disclaimed.
Int. Cl.[4] H02K *29/02*
U.S. Cl. 318—254 22 Claims

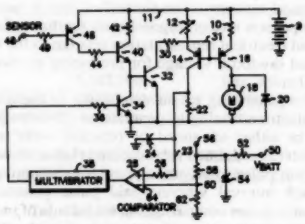


1. Brushless d-c cylindrical air gap motor (12) having
a permanent magnet rotor (13, 14);
a stator (22);
two-filamant winding means (40, 41) on said stator;
core elements (21) for said winding means and having part-circumferentially extending stator pole shoes (23) leaving gaps (24) between the ends of adjacent pole shoes,
said winding means being adapted to be selectively energized by a controllable current source (48, 49, 47, 54);
a galvano-magnetic sensor (16) responsive to the magnetic field from the rotor and providing output signals representative of the position thereof to control said controllable current source to energize the respective winding means of the core elements;
wherein, in accordance with the invention,
the stator (22) is at least a four-pole stator;
each filament (40, 41) of the winding means (45; 74, 75; 78, 79) associated with respective stator poles being so wound on the stator core elements and so energized that the number of North poles and South poles arising at the circumference of the core elements upon simultaneous energization of the respective filament is identical and the sum of magnetic flux at the circumference of said core elements—as it faces said air-gap—due to said energization of the respective filament is essentially zero, whereby unidirectional leakage flux from the motor and acting on the galvano-magnetic sensor is substantially reduced or eliminated,
further including a flux concentrating flux guide element (60) in flux linkage relation to the galvano-magnetic sensor, said flux concentration element having an extension portion (63) extending in the direction of rotation (26) of the motor for preferred capture of stray magnetic flux (B_{S1}) of the stator pole (23^{II}) subsequent—in the direction of rotation—to the sensor (16).

4,547,715
CURRENT CONTROL CIRCUIT

Edward Li, Roselle, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 9, 1984, Ser. No. 629,148
Int. Cl.[4] H02P *5/12*
U.S. Cl. 318—345 B 4 Claims

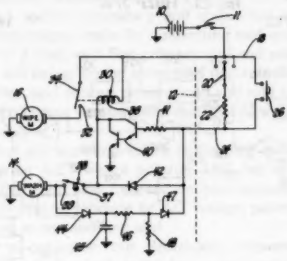


1. A control circuit comprising:
(a) a voltage source;
(b) a divider circuit having at least one input connected to said voltage source, said divider circuit further including a first transistor and a second transistor;
(c) a voltage monitor connected to an output of said first transistor;
(d) an inductive load connected to an output of said second transistor for connecting said inductive load to said voltage source;
(e) a voltage comparator including a source of reference potential and an input from said voltage monitor;
(f) a pulse source connected to an output from said voltage comparator; and
(g) a switching circuit including an input from said pulse source, said switching circuit capable of controlling said divider circuit to selectively disconnect said inductive load from said voltage source.

4,547,716
VEHICLE WINDSHIELD CLEANER CONTROL

Lynville G. Johnson, Kettering, and James O. Elliott, Beavercreek, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 14, 1984, Ser. No. 651,271
Int. Cl.⁴ H02P 1/04
U.S. Cl. 318—443 **6 Claims**



1. Windshield cleaner control apparatus for a motor vehicle having a wiper motor effective to drive a wiper across a windshield, washer apparatus including a washer motor effective to apply a cleaning fluid to the windshield in the path of the wiper and engine and passenger compartments separated by a firewall, the apparatus comprising, in combination:

an electric conductor through the firewall;

a wiper motor actuating circuit in the engine compartment comprising, in electrical series and in the following order, a source of electric power, the actuating coil of a wiper motor actuating relay, a park switch open only in a predetermined wiper park position, and the washer motor, the internal impedance of the actuating coil being sufficiently greater than that of the washer motor that current flow through the circuit sufficient to actuate the wiper motor does not actuate the washer motor;

circuit means connecting the junction of the actuating coil and park switch to the electric conductor;

switch control apparatus in the passenger compartment comprising first and second switches and a resistor, the first switch and resistor forming a series connected combination in parallel with the second switch between the source of electric power and the electric conductor, the resistor having an impedance sufficiently greater than the internal impedance of the washer motor that current flow through the first switch does not actuate the washer motor; and

means responsive through the electric conductor to closure of either of the first and second switches to establish a current flow through the actuating coil independently of the park switch to provide initial wiper motor actuation and thus close the park switch, whereby closure of the first switch results in actuation of the wiper motor only but closure of the second switch results in actuation of the washer motor.

4,547,717
ADJUSTING DEVICE FOR THE POINT OF ARTICULATION OR THE POINT OF DEFLECTION OF A SAFETY BELT

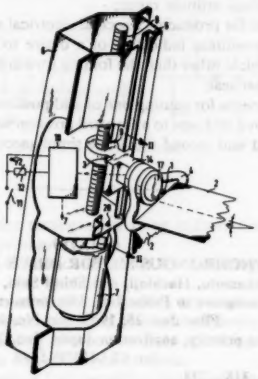
Karl-Heinz Radermacher, Pöcking, and Josef Haberl, Aschheim, both of Fed. Rep. of Germany, assignors to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 19, 1983, Ser. No. 486,492
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3214712
Int. Cl.⁴ H01H 7/00
U.S. Cl. 318—484 **18 Claims**

1. An adjusting device for the point of articulation or the point of deflection of a safety belt in automotive vehicles, said adjusting device comprising:

slide means, constituting the point of articulation or deflection;

guide means carrying said slide means where said slide means are vertically adjustable in said guide means so that the angle of articulation of the safety belt resting on the shoulder of the vehicle occupant has a first predetermined value; and



circuit means comprising:

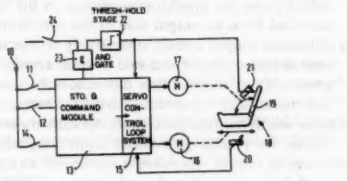
electric pickup means for sensing the angle of articulation of the safety belt,

a comparison circuit means responsive to said pickup, said comparison circuit means containing a reference of said first predetermined value and operable to adjust the slide means when the actual angle of articulation does not equal said first predetermined value.

4,547,718
VEHICLE SEAT POSITIONING SYSTEM WITH ENTRY-FACILITATING FEATURE

Rüdiger Ratzel, Bühl, and Erich Schneider, Kirchheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 7, 1982, Ser. No. 415,432
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137151
Int. Cl.⁴ G05B 19/42
U.S. Cl. 318—568 **5 Claims**



1. Vehicle seat-positioning system having means for producing on demand a set of positions representative electrical signals for at least one predetermined desired vehicle seat position, means for producing a set of electrical signals representative of actual vehicle seat position, means for producing error signals in response to said desired and actual vehicle position signals, means for operating a plurality of electrically driven positioning mechanisms in response to said error signals to bring a vehicle seat into a predetermined desired position, and

the improvement, for facilitating entry into and exit from said vehicle, comprising in combination:

means for folding forward the back of at least one front set out of the range of normal seating attitudes of said seat back, independently of said positioning mechanisms, actuatable either from inside the vehicle behind said front seat or from outside the vehicle through a door thereof;

means for producing a first electrical signal when a front seat of said vehicle has its back folded forwards, out of said normal attitude range;

means for producing a second electrical signal in response to a condition indicative of a desire to enter or leave the vehicle other than the folding forward of the back of said front seat;

and means for causing one of said positioning mechanisms to move said seat to a forward position when said first signal and said second signal are simultaneously present.

4,547,719

SYNCHRONOUS MOTOR DRIVE APPARATUS

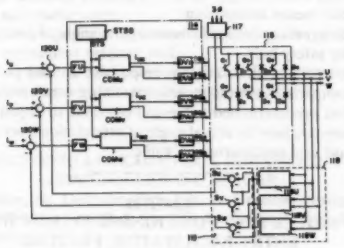
Keiji Sakamoto, Hachioji, and Shinji Seki, Tokyo, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

Filed Jan. 25, 1983, Ser. No. 460,982

Claims priority, application Japan, Jan. 28, 1982, 57-012118

Int. Cl.⁴ H02P *5/40*

U.S. Cl. 318—723 **8 Claims**



1. An apparatus for driving a synchronous motor, comprising:

a current detector circuit for detecting drive currents applied to the synchronous motor;

a current command circuit for producing current commands which drive the synchronous motor on the basis of a signal detected from an output side of the synchronous motor;

a difference output circuit, operatively connected to said current detector circuit and said current command circuit, for producing as outputs first differences between the current commands and the detected drive currents;

a pulse width modulation circuit, operatively connected to the motor, for producing inverter control signals;

an inverter circuit, operatively connected to said pulse width modulation circuit and said current detector circuit, for producing phase voltages for driving the synchronous motor; and

a voltage feedback loop comprising conversion means, operatively connected to said inverter circuit to receive the phase voltages applied to the motor, to said difference output circuit and to said pulse width modulation circuit, for converting the phase voltages to interphase voltages, for converting the interphase voltages to phase voltage signals, for combining the phase voltage signals with the first differences and for appling the combinations to said pulse width modulation circuit for controlling same.

4,547,720

INDUCTION MOTOR START-STALL DETECTION APPARATUS AND METHOD

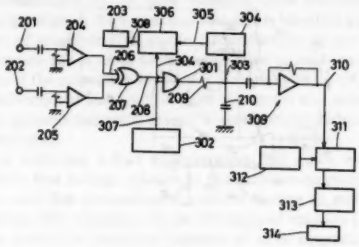
Stuart D. Loudon, Pretoria, South Africa, assignor to Newelec Pretoria Ltd., South Africa

Filed Oct. 11, 1983, Ser. No. 540,477

Claims priority, application South Africa, Oct. 8, 1982, 82/7366

Int. Cl.⁴ H02P *5/42*

U.S. Cl. 318—782 **14 Claims**



1. A stall detection apparatus for an electric induction motor, comprising:

means for monitoring the phase of the stator current and voltage;

a phase comparator for producing an output signal which is proportional to the phase difference between stator current and voltage; and

electronic means for utilizing the output signal to ascertain a stall condition and produce a stall condition signal, including a timer activated by said stall condition signal to produce a final stall condition signal if the first stall condition signal persists for a predetermined period measured by said timer, there being resetting means for resetting the timer if said first signal does not persist for said predetermined period.

4,547,721

TRANSFORMER STRUCTURE

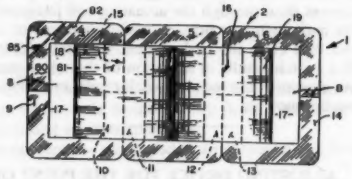
Joseph W. Drapp, 7022 Eugene Ave., St. Louis, Mo. 63116

Division of Ser. No. 211,756, Dec. 1, 1980, abandoned. This application Jun. 13, 1984, Ser. No. 620,039

The portion of the term of this patent subsequent to Sep. 4, 2001, has been disclaimed.

Int. Cl.⁴ H01F *17/00*

U.S. Cl. 323—355 **2 Claims**



1. A transformer, comprising:

a first core of magnetic material having spaced first and second legs and connecting portions therebetween;

a second core of magnetic material having third and fourth legs and connecting portions therebetween, the second leg of said first core being positioned near the third leg of said second core to form a first transformer winding carrier;

a third core of magnetic material having fifth and sixth legs and a connecting portion therebetween, the fifth leg of

said third core being positioned near the fourth leg of said second core to form a second transformer winding carrier;

a transformer winding including a primary winding having at least a first primary coil and a second primary coil connected in parallel and having input leads for connecting said primary winding to a source of electrical energy; and

a secondary winding having at least a first secondary coil and a second secondary coil connected in parallel and having output leads for connecting said secondary winding to a load, said first primary coil and said first secondary coil being wound about said first transformer winding carrier, said second primary coil and said second secondary coil being wound about said second transformer winding carrier,

said first and second primary coils being connected to produce an AC voltage polarity 180° out of phase in one another, and said first and second secondary coil being connected to produce an AC voltage polarity 180° out of phase in one another; and

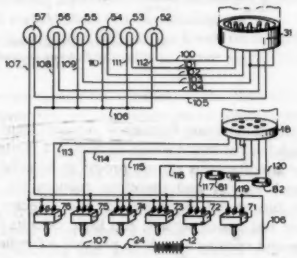
a pair of capacitor coils electrically connected, in voltage add mode for each individual capacitor coil, to the primary coils and electrically connected in series to one another through a capacitor.

4,547,722

TEST PANEL FOR TRACTOR AND TRAILER LIGHTS

Thomas J. Sarlo, 1218 N. 19th Ave., Melrose Park, Ill. 60660

Filed Apr. 6, 1983, Ser. No. 482,494
Int. Cl.⁴ G01R *31/02*
U.S. Cl. 324—51 **1 Claim**



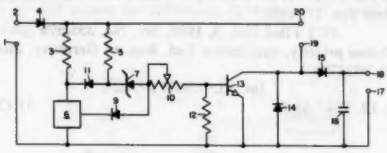
1. A tester for testing the electrical systems on trailers and tractors which can be electrically interconnected by a cable comprising, a housing with a first connector terminal with a number of electrical circuits for receiving the end of the tractor cable therein, a first plurality of test indicators mounted in the housing and electrically connected to said first connector terminal such that as the various electrical circuits of said tractor are closed in the tractor cab said first plurality of test indicators will be energized to indicate that the associated tractor circuit is properly operating, including a pair of battery terminals connected to said housing for connecting it to a battery, including a cable connected to said housing and with a second connector which can be connected to an electrical receptacle of a trailer and a plurality of switches connected to said battery and said second connector for testing various electrical circuits in the trailer, and including a second plurality of test indicators associated with said plurality of switches to indicate when said switches are on including a flasher connected between one of said plurality of switches and said second connector, wherein said first plurality of test indicators are electrical lights, wherein said second plurality of test indicators are electrical lights, wherein said plurality of switches have at least partially transparent actuators and said second plurality of test indicators mounted in said actuators, wherein said plurality of switches each contain said test indicators, and wherein said second connector can be connected to said first connector terminal for allowing the test circuits of said tester to be tested.

4,547,723

SIMPLE FLYBACK CHECKER

Norvel J. McLellan, 1002 N. Main St., Pleasanton, Tex. 78064

Filed Aug. 12, 1982, Ser. No. 407,572
Int. Cl.⁴ G01R *31/02*
U.S. Cl. 324—55 **1 Claim**



1. A coil tester for testing coils, using inductive kick or flyback effect, comprising:

an unfiltered half-wave rectifier means for supplying power for the test;

a switching device means for controlling a current through a coil under test, said switching device means being turned ON at the beginning of a power cycle and being turned OFF before the end of the power cycle;

a control device means for controlling said switching device means to be turned OFF after an appropriate time;

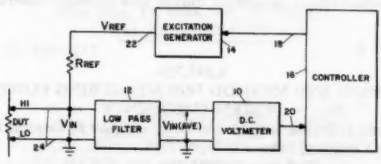
a peak detector means for receiving said inductive kick after said switching device is turned OFF and for supplying a voltage indicative of the condition of the coil under test.

4,547,724

METHOD AND APPARATUS FOR DETECTION OF NON-LINEAR ELECTRICAL DEVICES

Todd M. Beazley, Aloha, and Calvin D. Diller, Beaverton, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 7, 1983, Ser. No. 464,796
Int. Cl.⁴ G01R *27/00*
U.S. Cl. 324—57 R **4 Claims**



1. A method for detecting linear and non-linear electrical characteristics in a device under test, comprising the steps of:

(a) connecting said device under test in series with a reference device having a known impedance value and a linear electrical characteristic thereby to form a voltage divider;

(b) applying a substantially fixed DC voltage across said voltage divider;

(c) measuring the DC voltage value across said device under test in response to said fixed DC voltage in step (b);

(d) applying a positively going, substantially square wave voltage signal having an average voltage that is substantially equal to the fixed DC voltage applied across said voltage divider;

(e) measuring the average voltage value across said device under test in response to said square wave voltage signal in step (d); and

(f) comparing the DC voltage value measured in step (c) with the average voltage value measured in step (e), wherein said device under test is determined to be linear if

said compared values are substantially equal and non-linear if said compared values are substantially different.

4,547,725

METHOD AND APPARATUS FOR THE CONTINUOUS DETERMINATION OF MOISTURE POURABLE FOOD

Hans Oetiker, St. Gallen, and Emanuel Kummer, Gossau, both of Switzerland, assignors to Gebruder Buhler AG, Switzerland

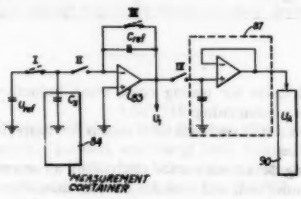
PCT No. PCT/CH80/00150, § 371 Date Feb. 17, 1982, § 102(e) Date Feb. 17, 1982

PCT Filed Dec. 5, 1980, Ser. No. 355,596

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1980, 3024794

Int. Cl.⁴ G01R *27/02*

U.S. Cl. 324—61 R **31 Claims**



1. A process for achieving measurement of the water content of moisture of a pourable food product stream moved along a production path, comprising the steps of passing the product continuously through an electric field created between conducting surfaces defining a condenser apparatus, measuring a quantity related to the capacitance of the condenser apparatus, converting the quantity to a characteristic value signal representing the product level, passing at least a part of the product through a measurement condenser with retarded motion, during which the measurement condenser is electrically charged in accordance with a predefined procedure, the amount of resultant charge stored on the condenser defining measurement values, passing the measurement values to an electronic evaluation circuit for determination of the moisture, and controlling the motion of said product to maintain said characteristic value substantially constant, whereby said condenser is filled to a predetermined level as the product passes through the measurement condenser during said moisture determination.

4,547,726

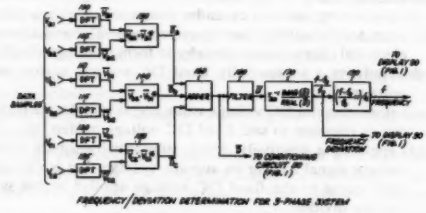
MEANS AND METHOD FOR MEASURING POWER SYSTEM FREQUENCY

William J. Premerlani, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 1, 1983, Ser. No. 519,335

Int. Cl.⁴ G01R *23/02*

U.S. Cl. 324—78 Z **50 Claims**



1. A method for determining frequency deviation of a signal from a predetermined reference frequency (f_0), comprising:

sampling said signal at at least four predetermined instants during each of a first and second cycle of said signal, wherein said first cycle precedes said second cycle, to generate a data value for each instant;

generating a first and second phasor representative of each of said first and second cycle of said signal, respectively, from the data values respectively associated with said first and second cycle of said signal; and

multiplying said second phasor by the complex conjugate of said first phasor to generate a frequency deviation phasor (D), wherein the angle of said frequency deviation phasor with respect to the real axis is indicative of frequency deviation of said signal from said predetermined reference frequency.

4,547,727

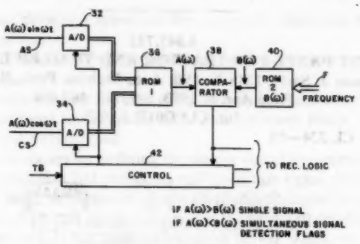
SIMULTANEOUS SIGNAL DETECTION FOR IFM RECEIVERS BY TRANSIENT DETECTION

James B. Y. Tsui, Centerville, and Rudy L. Shaw, Huber Heights, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 8, 1983, Ser. No. 512,064

Int. Cl.⁴ G01R *23/14, 23/16*

U.S. Cl. 324—79 D **5 Claims**



1. In an instantaneous frequency measurement (IFM) receiver which has receiving means including a limiter, which in response to simultaneous signals produces heterodyne signals which absorb energy and therefore reduces the output for signals in a filter band, discriminator and detector circuits to provide sine and cosine signals, and logic circuits for processing the sine and consine signals to provide a frequency output in a digital format as a frequency measurement, the improvement comprising:

transient detection means for digital detection of a simultaneous signal condition, comprising two analog-to-digital converters, first and second memories, and comparison means;

said converters having respective inputs coupled one to the sine line and the other to the cosine line of the receiver, and respective outputs providing the sine and cosine signals in digital form;

the converter outputs being coupled to address inputs of the first memory, which by table look up provides a digital output of the square root of the sum of the squares of the sine and cosine signals, and which used as the amplitude of a detector receiver signal;

the second memory having address inputs coupled to a given number of leads of said frequency output, the second memory having stored therein data for each frequency addressed data representing amplitude values at a lower level than the minimum amplitude at that frequency for a single signal condition;

the outputs of the first and second memories being connected to corresponding inputs of the comparison means, the comparison means having an output on which a comparison output signal is at a first level in response to the output of the first memory being less than the output of the second memory and otherwise being at a second level,

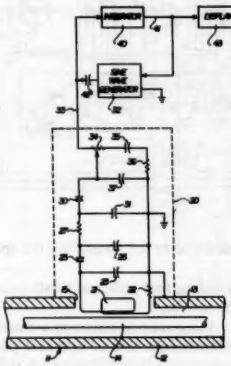
the presence of simultaneous signals being flagged when the comparison output signal is at the first level.

4,547,728

RF WATTMETER

Frank H. Mecklenburg, Chagrin Falls, Ohio, assignor to Bird Electronic Corporation, Solon, Ohio

Filed Aug. 31, 1982, Ser. No. 413,537
Int. Cl.⁴ G01R *21/04*
U.S. Cl. 324—95 **20 Claims**



1. An electronic instrument for measuring RF power levels on a coaxial transmission line comprising:

means for sensing the RF voltage levels on the transmission line and producing a first voltage wave signal proportional thereto;

first detector means for translating the first voltage wave signal from the sensing means into a sensed voltage wave signal corresponding to power in the transmission line;

means for generating a second voltage wave signal;

second detector means connected in opposition to the first detector means for translating the second voltage wave signal and supplying it in opposition to the sensed voltage wave signal to produce a difference signal;

means connecting the generating means and the second detector means, the connecting means comprising a line carrying a single composite signal, the second voltage wave signal and the difference signal forming parts of the single composite signal; and

means connected to the connecting means for integrating the difference signal to produce an output signal.

4,547,729

OPTICAL FIBER MEASURING DEVICES

Morgan Adolfsson, and Torgny Brogardh, both of Västerås, Sweden, assignors to Asea Aktiebolag, Västerås, Sweden

Continuation of Ser. No. 83,273, Oct. 10, 1979, abandoned. This application May 21, 1982, Ser. No. 380,880
Int. Cl.⁴ G01R *19/00, 5/28*
U.S. Cl. 324—96 **10 Claims**

1. Fiber optical device for measuring electrical signals comprising:

a transducer for receiving the electrical signals and including at least one deformable element for generating mechanical movement in response to said electrical signals and having means for filtering light mounted thereon;

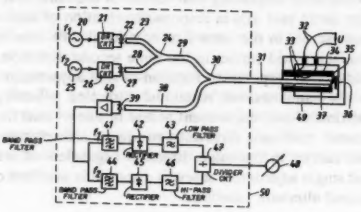
means for generating light having at least two different wavelengths;

a fiber optic light conductor for transmitting light to said transducer from said means for generating light;

means for reflecting light immovably mounted adjacent the transmission end of said fiber optic light conductor within said transducer;

said means for filtering being positioned between said fiber optic light conductor transmission end and said means for reflecting light to filter only one of the wavelengths of light generated by said means for generating light and moved in accordance with the deformation of said at least one deformable element;

said fiber optic light conductor transmitting the two different wavelengths of light generated by said means for generating light to said means for reflecting light and said means for filtering;



the mechanical movement of said means for filtering continuously modulating at least portions of the light to generate a measuring component light signal dependent upon said mechanical movement, and the light not intercepted by said means for filtering being reflected by said means for reflecting and being independent of said mechanical movement, whereby said measuring component light signal and said reflected light have different detectable characteristics;

said fiber optic light conductor transmitting said light measuring signal and said reflected light from said transducer; and

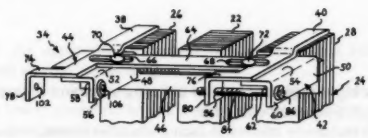
means for separating said measuring component light signal and said reflected light from one another.

4,547,730

LIGHT LOAD ADJUST APPARATUS FOR ELECTRIC METER

William H. Morong, Durham, N.H., assignor to General Electric Company, Somersworth, N.H.

Filed Mar. 19, 1984, Ser. No. 590,973
Int. Cl.⁴ G01R *11/02*
U.S. Cl. 324—137 **5 Claims**



1. A light load adjustment for an electric meter, said electric meter being of the type including at least a voltage coil having a core and a rotatable disk rotatable by a magnetic field at least partly produced by said voltage coil, said core having at least first and second legs disposed within a magnetic influence of said disk, comprising:

a frame rigidly attachable to said core;

a carrier;

means for slidably guiding said carrier on said frame along an axis parallel to a plane of said disk;

pole-shading means on said carrier disposable between said first and second legs and said disk and effective for at least partly distorting said magnetic field whereby a light load adjustment torque is applied to said disk;

a single light load adjustment screw;

first and second alternative locations for said adjustment

screw in said frame and said carrier, said first and second locations permitting adjustment access to said adjustment screw from first and second different locations with respect to said core, said first and second different locations being 180 degrees apart about said core; and

means at said first location for displacing said carrier in a first direction along said axis in response to rotation of said adjustment screw in a first rotational direction and for displacing said carrier in a second opposite direction along said axis in response to rotation of said adjustment screw in a second rotational direction, and means at said second location for displacing said carrier in the same first direction along said axis in response to rotation of said adjustment screw in the same first rotational direction and for displacing said carrier in the same second direction along said axis in response to rotation of said adjustment screw in the same second rotational direction whereby said rotation of said adjustment screw in one of said first and second rotational directions produces a displacement of said carrier in the same direction regardless of whether said single adjustment screw is disposed in said first or said second alternate locations.

4,547,731

HIGH FREQUENCY CURRENT INDUCING APPARATUS

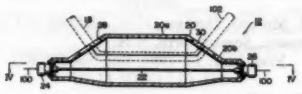
Tatsuo Teratani, Toyota, and Masao Kodera, Okazaki, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota and Nippon Soken, Inc., Nishio, both of, Japan

Filed Mar. 11, 1983, Ser. No. 474,323

Claims priority, application Japan, Mar. 24, 1982, 57-46962; May 14, 1982, 57-71026

Int. Cl.⁴ G01R *27/04*

U.S. Cl. 324—58 R **15 Claims**



1. A high frequency current inducing apparatus comprising:

a high frequency oscillator;

high frequency current inducing chamber means, connected to said high frequency oscillator, for inducing high frequency current in a wiring harness of an apparatus to be inspected, said chamber means comprising outer and inner conductors, said inner conductor being fixedly secured at a predetermined position inside said outer conductor, said outer conductor having two inserting holes and being separable into two outer conductor portions along a plane including said two inserting holes so that said wiring harness of said apparatus may be inserted along the axial direction of said chamber means between said outer and inner conductors without detaching said wiring harness from said apparatus to be inspected; and

a terminator connected to said high frequency current inducing chamber; wherein

said oscillator and said chamber means may induce high frequency current in said wiring harness while said harness resides in said chamber means.

4,547,732

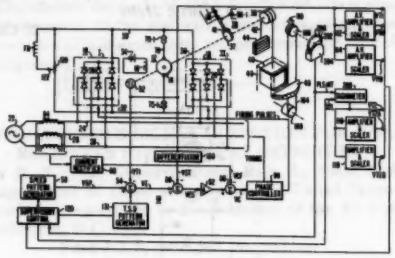
DIGITAL TACHOMETER

Alan L. Husson, Hackettstown, and Pantelis G. Tinios, Mt. Arlington, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 25, 1983, Ser. No. 479,047

Int. Cl.⁴ G01D *3/56*; G06M *3/06*

U.S. Cl. 324—166 **6 Claims**



1. A digital tachometer for measuring the speed of a device, comprising:

means for providing first pulses at a rate proportional to the speed of the device,

means for providing second pulses at a constant rate, which exceeds the maximum rate of said first pulses,

means for providing a binary count of the second pulses produced between two consecutive first pulses,

look-up table means for storing digital representations of speed, said look-up table means comprising a plurality of memory blocks each having a plurality of addressable storage locations,

means responsive to the bit position of the MSB of the binary count for selecting a memory block,

said MSB defining a count having a predetermined maximum number of binary words according to the bit location of the MSB,

means deriving an address from the binary count,

said binary address starting with and including the MSB,

said binary address having fewer bits than the number of bits in the binary count from which it was derived, regardless of the bit position of the MSB, such that the maximum number of binary words for any bit position of the MSB is less than the predetermined maximum number of binary words defined by the bit position of the MSB,

and means for addressing the selected memory block with the derived address to obtain the digital representation of speed stored at this address.

4,547,733

AMPLITUDE AND PHASE MEASUREMENT IN ELECTROMAGNETIC LOGGING

Yvon Thoraval, Le Plessis-Robinson, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 18, 1981, Ser. No. 332,119

Claims priority, application France, Dec. 31, 1980, 80 27869

Int. Cl.⁴ G01V *3/24*; G01R *25/14*; H03D *13/00*

U.S. Cl. 324—338 **14 Claims**

1. An electromagnetic logging apparatus for investigating properties of an earth formation surrounding a borehole, comprising:

a support member movable through said borehole;

a transmitter supported by said support member for transmitting electromagnetic energy toward said formation;

a receiver supported on said support member a predetermined distance from said transmitter for receiving electromagnetic energy from said formation to provide a received signal;

means for amplifying with high gain stability said received signal;

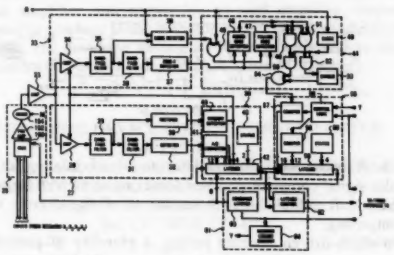
means for amplifying with high phase stability said received signal;

means for controlling the gain of said gain stabilized amplifying means, the output thereof further being provided to said phase stabilized amplifying means for controlling the gain thereof;

means coupled to said gain stabilized amplifying means for detecting the amplitude of said received signal;

means coupled to said phase stabilized amplifying means for detecting a zero crossing of said received signal;

means for measuring said amplitude; and



means for determining a value of the phase of said received signal relative to the phase of the electromagnetic energy transmitted by said transmitter comprising:

a rising edge detector coupled to said zero crossing detecting means and responsive to a reference signal indicative of the electromagnetic energy transmitted by said transmitter;

a falling edge detector coupled to said zero crossing detecting means and responsive to said reference signal; and

a counter coupled to said rising edge detector and said falling edge detector for determining an offset-compensated phase value.

4,547,734

EQUIPMENT FOR RECOGNIZING MISFIRING

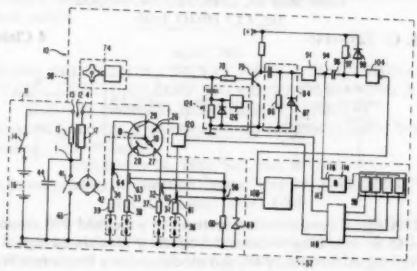
Heinz-Werner Spaude, Aichtal, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 9, 1983, Ser. No. 473,591

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1982, 3208587

Int. Cl.⁴ F02P *17/00*

U.S. Cl. 324—395 **37 Claims**



1. An equipment for recognizing misfirings in an externally controlled ignition internal combustion engine comprising

plural ignition circuit means each including a spark plug,

an ignition distributor means for conducting an ignition voltage in predetermined order to said plural ignition circuit means,

at least one differentiating circuit means constructed as a high-pass filter means coupled to each ignition circuit means between the ignition distributor means and the respective spark plug for decoupling a voltage signal from the ignition circuit means, a voltage circuit being exclusively associated with the voltage changes occurring at the initiation of the ignition spark over the spark gap of the plug,

a reference voltage circuit means for generating electrical output signals characteristic of the firing point in the ignition circuit means,

OR gate means receiving the output of the high-pass filter means, and

analysis and indicator circuit means receiving the output of the OR gate means for producing output signals characteristic of correct or erroneous functioning of the ignition system by logic processing of the filter means output signals and of the output signals of the reference circuit means.

4,547,735

INSTRUMENT FOR MEASURING THE HEMATOCRIT VALUE OF BLOOD

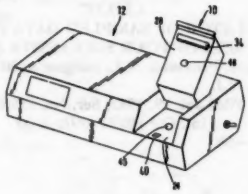
Holger Kiesewetter, Schneebergweg 211, 5100 Aachen, Fed. Rep. of Germany; Heinz Myrenne, Roetgen, Fed. Rep. of Germany; Hartmut Lazar, and Klaus Mussler, both of Aachen, Fed. Rep. of Germany, assignors to Holger Kiesewetter, Munich, Fed. Rep. of Germany

Filed Jan. 24, 1983, Ser. No. 460,565

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1982, 3202067

Int. Cl.⁴ G01N *27/28*

U.S. Cl. 324—450 **15 Claims**



1. An apparatus for measuring the hematocrit value of a blood sample comprising:

an upper electrode having a sample contact surface;

a lower electrode having a sample contact surface which is substantially the same size and shape as said upper electrode contact surface;

means for selectively moving the electrodes between a blood sample measurement position and a second position where said electrodes are displaced away from each other to facilitate cleaning of the electrode faces and introduction of blood samples onto the electrode faces and wherein said electrode faces in said sample measurement position are substantially parallel with said upper electrode face being located directly above said lower electrode face at a spaced distance from said lower electrode face such that a blood sample defining a cylindrical column having a vertical axis may be formed between said upper and lower electrode faces, said electrode faces being oriented such that sedimentation of said blood sample occurs along the vertical axis of said blood sample column; and

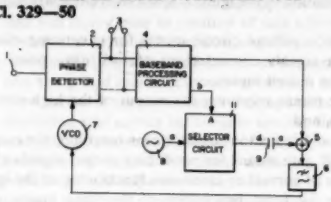
conductometry means connected to said electrodes for measuring the hematocrit value of the blood sample.

4,547,736

PHASE LOCK LOOP PSK DEMODULATOR WITH SWEEP CONTROL CIRCUIT

Koichiro Takeda, Abiko, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 502,595, Jun. 9, 1983, abandoned. This application Jan. 24, 1985, Ser. No. 693,840
Claims priority, application Japan, Jun. 18, 1982, 57-105205
Int. Cl.[4] H04L *27/22*; H03L *7/12*
U.S. Cl. 329—50 **6 Claims**



4. A phase-locked loop circuit receiving an input signal, comprising:

sweep signal means for generating a sweep signal having a level;

phase-locked loop means, operatively connected to receive the input signal, for demodulating the input signal using a phase-locked loop by adding the sweep signal to a phase signal and for outputting a decision signal indicating one of a phase-locked state and a phase-unlocked state; and

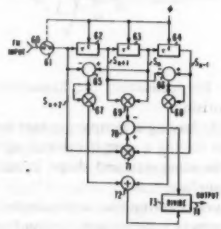
sweep signal freeze means, operatively connected to said sweep signal means and said phase-locked loop means, for maintaining the sweep signal at the level being output when the decision signal indicates the phase-locked state, until the decision signal indicates the phase-unlocked state.

4,547,737

DEMODULATOR OF SAMPLED DATA FM SIGNALS FROM SETS OF FOUR SUCCESSIVE SAMPLES

John J. Gibson, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jul. 29, 1983, Ser. No. 518,806
Int. Cl.[4] H03D *3/18, 3/00*
U.S. Cl. 329—50 **18 Claims**



1. Apparatus for detecting the instantaneous frequency deviation of a signal having a frequency spectrum centered about the frequency f_c, comprising:

means for sequentially sampling said signal at a sampling rate to produce successive adjacent samples that are substantially orthogonal components of said signal;

means for storing successive signal samples so that at least four successive signal samples are simultaneously available;

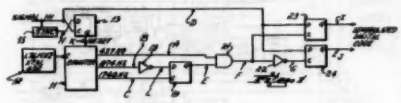
means responsive to sets of successive samples for successively combining said sets of samples to produce sample values F_n corresponding to differences of cross products of the average values of said orthogonal components times derivatives of said orthogonal components, said values, F_n, corresponding to the instantaneous frequency deviation of said signal.

4,547,738

PHASE SHIFT DEMODULATOR

Robert S. Bayer, West Milford, and Mark A. Petronaci, Rockaway, both of N.J., assignors to American Standard Inc., New York, N.Y.

Filed Jun. 10, 1983, Ser. No. 503,036
Int. Cl.[4] H03K *9/04*
U.S. Cl. 329—107 **9 Claims**



1. A phase shift demodulator for demodulating an input pulse signal comprising pulses occurring at a given frequency, phase shift modulated with sequences of digital code words, comprising:

a clock-driven counter having a plurality of pulse signal outputs of differing frequencies, one of which corresponds substantially to said given frequency of the modulated input pulse signal;

means for synchronizing the pulse signal outputs of the counter with the unmodulated phase of the input pulse signal at the beginning of a sequence of digital code words which modulate said given frequency of the input pulse signal;

strobe means, coupled to said plurality of counter outputs, for combining said plurality of counter outputs to produce a strobe signal output, differing from each counter output of said plurality of counter outputs, including a strobe signal for each word in a sequence of digital code words modulating said given frequency of the input pulse signal; and

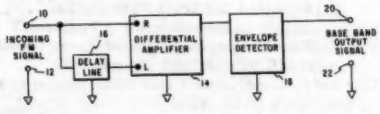
output means, coupled to the strobe signal output and to the input pulse signal, for producing sequences of demodulated digital code words based upon the condition of the input pulse signal when each said strobe signal is produced.

4,547,739

SIGNAL DEMODULATION SYSTEM FOR WIDEBAND FM

Joseph F. Lutz, 1409 Tourney Dr., San Jose, Calif. 95131

Filed May 16, 1983, Ser. No. 495,232
Int. Cl.[4] H03D *3/00*
U.S. Cl. 329—145 **4 Claims**



1. A signal demodulation system for wideband FM responsive to an incoming wideband frequency modulated signal of carrier signal frequency W_c and modulated at a frequency W_m, the signal having a peak deviation incremental frequency ΔW_p, the carrier having an amplitude A, to derive therefrom a demodulated output signal, said system comprising:

a lossless delay line having a group delay t which is essentially constant over the band of said wideband modulated signal where $t_0=N/(4f_c)$, N is an odd integer and

$f_c = W_c/(2\pi)$, said line having an input to which said incoming signal is applied and having an output at which a delayed incoming signal appears;

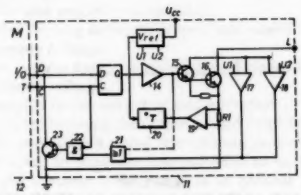
a differential amplifier having a first input to which said incoming signal is applied and a second input coupled to the delay line to receive said delayed signal, said amplifier having an output and performing direct vector addition of the incoming signal and delayed signal to produce at said output an amplitude modulated and frequency modulated signal, which is the direct vector sum of the incoming signal and the delayed signal amplified by the gain A_d of the amplifier, A_d being essentially uniform over said wideband; and

an envelope detector coupled at its input to the output of said amplifier and responsive to said amplifier output signal to produce at the detector output said demodulated signal, the envelope having an RMS value equal to the quantity $0.5AA_d[(1+\sin \Delta W_p t_o)^{\frac{1}{2}} - (1-\sin \Delta W_p t_o)^{\frac{1}{2}}]$.

4,547,740
MONITORING DEVICE FOR INTEGRATED DRIVE AMPLIFIERS

Kurt A. I. Nilsson, Åkersberga, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Mar. 28, 1984, Ser. No. 594,371
Int. Cl.[4] G01R 19/00
U.S. Cl. 330—2 **9 Claims**



1. In a system wherein a digital controller controls via a single data line a driver amplifier whose output is connected to a load and wherein the digital controller further includes a source of clock pulses, apparatus for presenting an indication of a fault in the driver amplifier-load combination to the single data line comprising a D-type flip-flop having a D-data input connected to said data line for receiving control signals from the digital controller, a C- clock input connected to the source of clock pulses, and an output connected to the driver amplifier, a fault detection means for detecting a fault in the driver amplifier-load combination, and a logic means connecting said fault detection means to said data line and responsive to the clock pulses for applying a particular voltage level representing a particular logic value when said fault detection means detects a fault to the data line only during the times between clock pulses.

4,547,741
NOISE REDUCTION CIRCUIT WITH A MAIN SIGNAL PATH AND AUXILIARY SIGNAL PATH HAVING A HIGH PASS FILTER CHARACTERISTIC

Masayuki Katakura, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 24, 1983, Ser. No. 497,415
Claims priority, application Japan, May 29, 1982, 57-92279
Int. Cl.[4] H03F 1/26, 3/68
U.S. Cl. 330—149 **21 Claims**

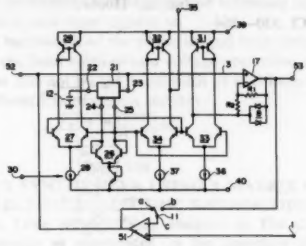
1. A noise reduction system having a main signal path and an auxiliary signal path with the characteristics of a high-pass filter having a controllable cut-off frequency, an output signal of the main signal path and an output signal of the auxiliary signal path being summed to form a system output signal, in which the auxiliary signal path comprises:

voltage-to-current converter means having differential inputs connected to said main signal path and differential outputs;

PN junction means connected to said differential outputs of said voltage-to-current converter means;

a first common emitter configuration transistor pair having base electrodes connected to said PN junction means;

capacitance means connected to a first differential input of said voltage-to-current converter means;



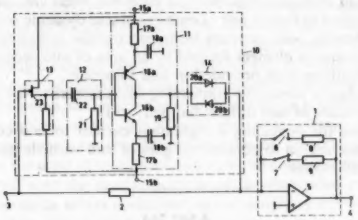
feedback means connecting a collector circuit of said first common emitter transistor pair to said first differential input of said voltage-to-current converter means; and

a second common emitter configuration transistor pair having base electrodes connected to said PN junction means, whereby said output signal of the auxiliary signal path is derived from a collector circuit of said second common emitter configuration transistor pair.

4,547,742
AMPLIFIER CIRCUIT WITH SURGE SUPPRESSION

Martin Maschek, Würenlos, Switzerland, assignor to BBC, Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Aug. 9, 1984, Ser. No. 639,063
Claims priority, application Switzerland, Aug. 18, 1983, 4510/83
Int. Cl.[4] H03F 1/14
U.S. Cl. 330—149 **12 Claims**



1. An amplifier circuit comprising:

a signal input and a signal output;

a signal amplifier including an inverting dc negative feedback amplifier, and means connected to said signal input for applying an input signal to said feedback amplifier, said feedback amplifier having an output connected to said signal output; and

compensating circuit means connected to said input signal applying means for suppressing surges existing on said signal input, comprising,

an inverting amplifier connected to said signal input and characterized by a limiting frequency greater than that of said feedback amplifier, and

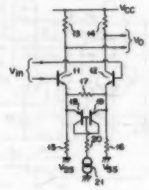
a voltage limiting two-terminal network connected in series with said inverting amplifier and defining a transfer characteristic such that for voltages below a predetermined threshold said network is substantially non-conductive in both directions and for voltages above said threshold, said network is conducting and the output of said inverting amplifier is connected to said means applying an input to said feedback amplifier.

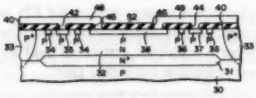
4,547,743

VARIABLE RESISTANCE GAIN CONTROL INTEGRATED CIRCUIT

Kuniaki Goto, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 13, 1983, Ser. No. 531,616
Claims priority, application Japan, Sep. 20, 1982, 57-163406
Int. Cl.⁴ H03G *3/30*
U.S. Cl. 330—254 **15 Claims**





12. A dynamic resistance element for use in a variable gain control circuit receiving an input at a differential transistor pair comprising, in combination:

a semiconductor substrate of a first conductivity type forming a common base region;

interconnected collector areas of a second conductivity type provided in said substrate adjacent said common base region to form a pair of electrically common collectors in said dynamic resistance element;

emitter areas of said second conductivity type provided in said substrate adjacent said collector areas and said base region to form a pair of emitters in said dynamic resistance element, said emitters being electrically connected by a resistance element formed by an area of said second conductivity type provided in said substrate;

conductor means for connecting said emitters to the emitter circuits of said differential pair; and

means for providing a regulating current to said common base region to control the gain of said variable gain control circuit.

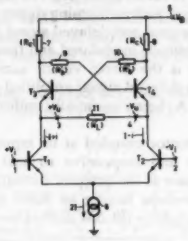
4,547,744

INTEGRATED AMPLIFIER ARRANGEMENT

Wolfdietrich G. Kasperkovitz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 28, 1981, Ser. No. 268,047
Claims priority, application Netherlands, Jun. 2, 1980, 8003197
Int. Cl.⁴ H03F *3/45*
U.S. Cl. 330—261 **7 Claims**

1. An integrated amplifier arrangement, comprising a first and a second transistor, whose base electrodes lead to an input of the amplifier arrangement, whose emitter electrodes are coupled to each other, and whose collector electrodes lead to an output of the amplifier arrangement, which output is loaded by an output impedance, and via a load circuit to a supply terminal, the load circuit, in order to increase the gain at higher frequencies, comprising a third and fourth transistor of the same conductivity type as that of the first and the second transistors, the main current path of said third and fourth transistor, respectively, being connected in series with the main current path of the first and second transistor, respectively, the emitter electrode of the third and the fourth transistor, respectively, being connected to the collector electrode of the first and the second transistor, respectively, and the collector electrode of the third and the fourth transistor, respectively, being connected to said supply terminal via a first and a second impedance, respectively, a third and fourth impedance



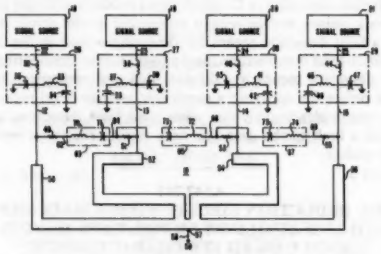
being included in the base circuit of the third and the fourth transistor, respectively, characterized in that the base electrode of the third transistor is connected to the collector electrode of the fourth transistor via said third impedance and the base electrode of the fourth transistor is connected to the collector electrode of the third transistor via said fourth impedance.

4,547,745

COMPOSITE AMPLIFIER WITH DIVIDER/COMBINER

Ronald G. Freitag; James E. Degenford, both of Ellicott City, and Daniel C. Boire, Glen Burnie, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 28, 1983, Ser. No. 470,650
Int. Cl.⁴ H03F *3/60, 3/16;* H01P *5/12*
U.S. Cl. 330—286 **16 Claims**



1. A power combiner for combining a plurality of microwave input signals comprising:

a plurality of input terminals adapted for coupling to said microwave input signals,

each said input terminal coupled to a first end of a respective transmission line and to a first end of a respective resistor,

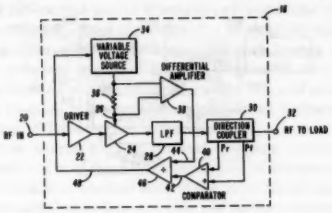
the second ends of said transmission lines coupled together to combine the input signals at an output terminal,

each second end of said resistors coupled through one or more coupling circuits to said second end of said remaining resistors to provide electrical isolation between said input terminals.

4,547,746
VSWR TOLERANT LINEAR POWER AMPLIFIER

Alan R. Erickson, Marion, and Marvin W. Heidt, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 9, 1984, Ser. No. 597,993
Int. Cl.[4] H03G *3/20*
U.S. Cl. 330—298 **10 Claims**



3. In a broadband frequency hopping system having an audio source, a modulator responsive to said audio source for modulating a carrier frequency, a means for changing said carrier frequency in response to a frequency control, an amplifier for amplifying said carrier frequency, and an antenna coupled to transmit said amplified modulated carrier frequency, the improvement in said amplifier comprising:

an amplifier, having an input, output, and means for receiving a supply voltage;

a variable voltage supply coupled to said means for receiving a supply voltage;

a load coupled to the output of said amplifier;

means coupled between the output of said amplifier and said load for providing a signal representing power;

means coupled to sense current provided to said amplifier from said variable voltage supply to provide an output signal;

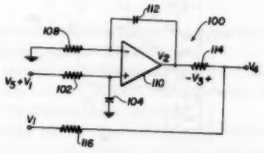
means for dividing said signal representing power by said output signal to provide a control signal; and

means responsive to said control signal for changing the voltage of said variable voltage supply.

4,547,747
PHASE LOCKED LOOP FOR HIGH SPEED DATA

Dan H. Wolaver, Worcester, Mass., and Warren E. Little, Salem, N.H., assignors to General Signal Corporation, Stamford, Conn.

Filed Mar. 11, 1983, Ser. No. 474,489
Int. Cl.[4] H03L *7/00*
U.S. Cl. 331—17 **8 Claims**



1. A phase locked loop circuit for digital electronic signals comprising:

voltage controlled oscillator means for providing variable reference signals;

means for comparing the frequency of digital input signals having coded data thereon and the frequency of said reference signals, and outputting an electrical signal representing the difference between these frequencies;

means for comparing the phase of said digital input signals and said reference signals, and outputting an electrical signal representing the difference between these phases;

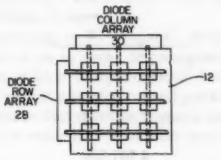
loop filter means responsive to the output signals of said frequency and phase comparison means, and having an output connected to said voltage controlled oscillator means, for producing control signals with no high-frequency bandwidth roll-off, which causes said voltage controlled oscillator means to alter said reference signals to conform to said input signals; an

whereby the bandwidth of the phase locked loop circuit is limited by the bandwidth of said voltage controlled oscillator means and not by the bandwidth of said loop filter means, without loss of circuit stability.

4,547,748
FREQUENCY SYNTHESIZER USING A MATRIX OF SELECTABLE PIEZOELECTRIC RESONATORS

Arthur Ballato, Long Branch, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 13, 1984, Ser. No. 639,755
Int. Cl.[4] H03B *5/32*
U.S. Cl. 331—49 **8 Claims**



1. A frequency synthesizer comprising a resonator matrix including a plurality of resonators embedded in a single monolithic piece of piezoelectric crystal, said resonators being arranged in rectangular row and column configuration including m rows and n columns, each of said resonators being separated from its neighboring resonators by distances such that the resonant energies do not overlap, each of said rows of resonators bearing a metallic electrode stripe for that row and each of said columns of resonators bearing a metallic electrode stripe for that column, said electrode row stripes being positioned on the top surface of the crystal, said electrode column stripes being positioned on the bottom surface of the crystal and wherein the areas of overlap of said row and column stripes are registered with the central portions of the embedded resonators, two diode arrays positioned on the periphery of the crystal for addressing the individual row electrode stripes and the individual column electrode stripes so that any desired resonator can be activated by connecting the stripe corresponding to its row address and the stripe corresponding to its column address to a suitable active oscillator network.

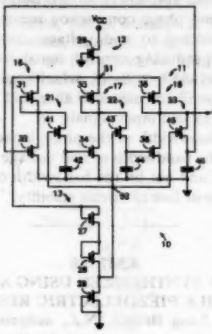
4,547,749
VOLTAGE AND TEMPERATURE COMPENSATED FET RING OSCILLATOR

Clinton C. K. Kuo, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 29, 1983, Ser. No. 566,608
Int. Cl.[4] H03B *5/00;* **H03K** *3/26;* **H03L** *1/00, 1/02*
U.S. Cl. 331—57 **6 Claims**

1. In an oscillator circuit having inverter and delay stages coupled between a reference node and a first power supply terminal wherein the voltage at the reference node affects, in direct proportion, the frequency of oscillation of the oscillator circuit, a voltage compensation circuit, comprising:

a depletion transistor having a first current electrode coupled to a second power supply terminal, a control elec-



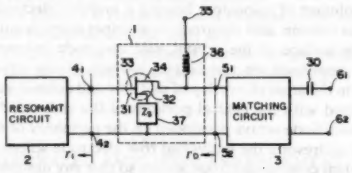
trode coupled to the first power supply terminal, and a second current electrode coupled to the reference node.

4,547,750

FET OSCILLATOR EXHIBITING NEGATIVE RESISTANCE DUE TO HIGH IMPEDANCE AT THE SOURCE OF AN FET THEREOF

Hideki Torizuka, Kawasaki; Tomohide Soejima, Yokohamashi, and Shigekazu Hori, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jan. 18, 1983, Ser. No. 458,940
Claims priority, application Japan, Jan. 20, 1982, 57-5886
Int. Cl.⁴ H03B *5/04, 5/18*
U.S. Cl. 331—99 **8 Claims**



1. An FET oscillator exhibiting negative resistance due to a high impedance at the source of the FET thereof, comprising:

a negative resistance circuit including a strip line of predetermined length, a biasing circuit, a resistor and a field effect transistor, said field effect transistor having a drain which is biased through said biasing circuit and a source which is connected to said strip line of predetermined length, said strip line being grounded via said resistor at a position which results in said strip line exhibiting substantially ground potential level at the oscillation frequency of said oscillator, thereby providing a negative resistance between the gate and drain of said field effect transistor, and

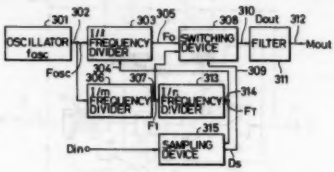
a resonant circuit connected to said negative resistance circuit for determining the oscillation frequency of said oscillator.

4,547,751

SYSTEM FOR FREQUENCY MODULATION

Yukio Nakata, Kawasaki, and Osamu Shiotsu, Ageo, both of Japan, assignors to Hitachi, Ltd. and Yagi Antenna Co., Ltd., both of Tokyo, Japan

Filed May 6, 1983, Ser. No. 492,218
Claims priority, application Japan, May 7, 1982, 57-75200
Int. Cl.⁴ H03C *3/00*
U.S. Cl. 332—16 R **8 Claims**



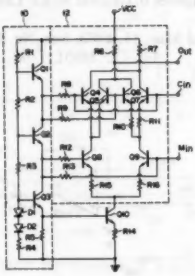
1. A system for frequency modulation, comprising: oscillating means for generating a signal having a predetermined frequency; first and second frequency-dividing means for subjecting the signal generated by said oscillating means to frequency division by different integers l and m and to generate first and second signals, respectively, which are synchronized with each other; third frequency-dividing means for subjecting an output signal from said second frequency-dividing means to frequency division by an integer n selected so that the product m×n is the least common multiple of l and m; control means for controlling input data in accordance with an output signal from said third frequency-dividing means; and switching means for selecting one of the output signals from said first and second frequency-dividing means in accordance with a logical value of an output signal from said control means to generate a frequency modulated output.

4,547,752

AMPLITUDE MODULATOR WITH THREE DIFFERENTIAL TRANSISTOR PAIRS

Seitaro Shinbara, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 29, 1983, Ser. No. 480,005
Claims priority, application Japan, Mar. 31, 1982, 58-53481
Int. Cl.⁴ H03C *1/00*
U.S. Cl. 332—31 T **3 Claims**



1. An amplitude modulator, for producing an amplitude modulated signal that includes an amplitude-modulated component of a carrier signal, which comprises:

a first differential pair of transistors, one of which is supplied with said carrier signal at a base thereof;

a second differential pair of transistors, one of which is also supplied with said carrier signal at a base thereof;

first and second resistors, with one end of said first resistor

connected to the emitter of one of said first differential pair of transistors, one end of said second resistor connected to the emitter of the other one of said first differential pair of transistors, and with the other ends of said first and second resistors connected together at a node, said first and second resistors each having a higher resistance than the emitter resistance of each one of said first differential pair of transistors;

a third differential pair of transistors of which one transistor is supplied at a base thereof with a modulating signal, said third differential pair of transistors each having a collector, with one of said collectors coupled to said node of said first and second resistors and the other of said collectors coupled to a common connection of emitters of said second differential pair of transistors;

a current source coupled to said common connection of emitters of said third differential pair of transistors; and

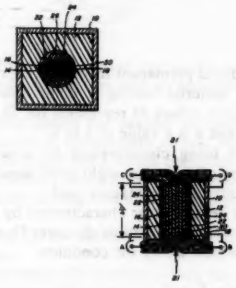
a load resistor connected both to the collector of one transistor in said first differential pair and to the collector of one transistor in said second differential pair.

4,547,753

MICROWAVE COUPLER

Harry F. Chapell, Maynard, Mass., assignor to Sage Laboratories, Inc., Natick, Mass.

Filed Nov. 14, 1983, Ser. No. 550,774
Int. Cl.[4] H01P *5/18*
U.S. Cl. 333—115 **15 Claims**



11. A microwave transmission line apparatus comprising:

means defining an outer conductor,

first and second inner conductors at least one of which has insulation bonded thereto and separated by the thickness of said insulation there between,

an insulating sleeve disposed in said outer conductor and adapted to accommodate said first and second inner conductors,

a means for filling the void between the insulating sleeve and the inner conductors with an insulating material having a relatively high dielectric constant particularly in comparison with the dielectric constant of the insulating sleeve,

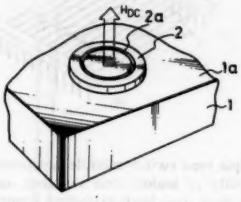
the means for filling having a dielectric constant selected in comparison with the dielectric constant of the insulating sleeve so as to decrease the even mode velocities so as to approach equalization between the even and odd mode propagation velocities.

4,547,754

FERROMAGNETIC RESONATOR

Yoshikazu Murakami, Yokohama, and Hiromi Yamada, Chigasaki, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 5, 1983, Ser. No. 557,953
Claims priority, application Japan, Dec. 6, 1982, 57-214426; Dec. 6, 1982, 57-214427
Int. Cl.[4] H01P *7/08*
U.S. Cl. 333—219 **8 Claims**



1. A ferromagnetic resonator comprising:

a layer of ferrimagnetic material;

means for applying a DC magnetic field perpendicularly to said ferrimagnetic layer;

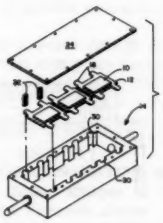
means for applying an RF magnetic field to said ferrimagnetic layer so as to cause ferromagnetic resonance; said ferrimagnetic layer being processed, during fabrication, to have a groove at a predetermined position on one surface of said layer so that spurious response caused by magnetostatic modes other than a uniform mode is suppressed.

4,547,755

MICROWAVE CIRCUIT STRUCTURE AND METHOD OF MOUNTING

John E. Roberts, Los Altos, Calif., assignor to Watkins Johnson Company, Palo Alto, Calif.

Filed Mar. 27, 1984, Ser. No. 593,908
Int. Cl.[4] H01P *1/00*
U.S. Cl. 333—246 **7 Claims**



1. A microwave circuit and housing comprising

a housing having a bottom surface and opposing side walls and end walls,

a cover for said housing,

a plurality of slots in said opposing side walls, said slots being parallel to said side walls and running from one edge to an opposing edge of each side wall,

at least one microwave circuit including a substrate having a plurality of tabs extending therefrom, said substrate positioned on said bottom surface with said tabs extending into said slots in said opposing side walls, and

pillars engaging and filling said slots and engaging said tabs.

4,547,756

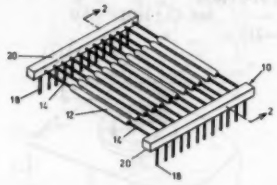
MULTIPLE REED SWITCH MODULE

Norbert D. Miller, Jefferson, and Craig V. LaFleur, Lake Mills, both of Wis., assignors to Hamlin, Inc., Lake Mills, Wis.

Filed Nov. 22, 1983, Ser. No. 554,444

Int. Cl.⁴ H01H *1/66*

U.S. Cl. 335—152 **8 Claims**



1. A multiple reed switch module comprising:

(a) a plurality of sealed reed switches, each reed switch having a body, two leads extending linearly outward from the body, and lead ends which are parallel to each other, but perpendicular to the linear axis of the leads;

(b) two electrically non-conductive side rails which hold the reed switches in fixed spacial relation and orientation to each other, the first side rail attached to the leads which extend from one side of the reed switch bodies, and the second side rail attached to the leads which extend from the other side of the reed switch bodies, so that together the reed switches and the side rails form a singular module which can be inserted into, and removed from, a socket mounted on a printed circuit board, the reed switch bodies in the module being separated from the side rails and fully exposed for inspection and access during insertion and operation of the module on a printed circuit board.

4,547,757

ELECTROMAGNET YOKE STRUCTURE

Toshiaki Yamada, Higashi Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

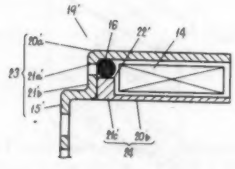
PCT No. PCT/JP82/00124, § 371 Date Dec. 15, 1982, § 102(e) Date Dec. 15, 1982

PCT Filed Apr. 16, 1982, Ser. No. 456,073

Claims priority, application Japan, Apr. 17, 1981, 56-58720; May 12, 1981, 56-70904

Int. Cl.⁴ H01F *7/16*

U.S. Cl. 335—296 **6 Claims**



1. An electromagnet, comprising:

a. a housing for a load rotary body;

b. an annular movable electromagnet section formed of magnetic material, of U-shaped radial cross section having an open end and a closed end, defining an annular groove therein, said movable section including radially spaced outer and inner cylindrical walls;

c. a plurality of bearings, said movable section being rotatable supported by said housing through said bearings;

d. a fixed electromagnetic section disposed in said annular groove, said fixed section including a winding coil box body which includes an outer sleeve opposing said outer cylindrical wall and an inner sleeve opposing said inner cylindrical wall, and an axially and radially thick magnetic yoke having radially opposite sides, joining said inner and outer sleeves at said open end of said movable section, and opposing said inner and outer cylindrical walls at said radially opposite sides;

e. a winding coil wound about said inner sleeve, bounded radially outwardly by said outer sleeve and on one axial side by said magnetic yoke, said magnetic yoke with said movable electromagnetic section defining a magnetic path about said winding coil, said magnetic yoke having first and second axially opposite sides respectively facing and opposite said winding coil; and

f. a flange extending from said second side of said magnetic yoke to said housing and fixedly supporting said fixed section on said housing;

said winding coil having a circumferentially extending lead wire connection for external electrical connection to said winding coil, said magnetic yoke having a circumferentially extending storage space therein between said radially opposite sides, containing said lead wire connection and having at least one opening therein for electrical connection therethrough to said lead wire connection.

4,547,758

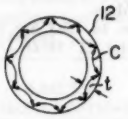
CYLINDRICAL PERMANENT MAGNET AND METHOD OF MANUFACTURING

Motoharu Shimizu, Kumagaya; Noriyuki Noda, and Yoshihiro Noguchi, both of Fukaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Dec. 2, 1982, Ser. No. 446,322

Int. Cl.⁴ H01F *7/02*

U.S. Cl. 335—302 **5 Claims**



1. A cylindrical permanent magnet, comprising:

a sintered material having a composition expressed by $MO.nFe_2O_3$, where M represents Ba, Sr, Pb or a mixture thereof, and n is a value of 5 to 6,

the magnet being characterized by a surface multipolar anisotropy of more than eight poles imparted to the cylindrical portion of the magnet, and

the magnet being further characterized by having an inside diameter D_1 and an outside diameter D_2 of the cylindrical portion which satisfy the condition:

$$D_1/D_2 = 1 - K_1\pi/P$$

where P is the number of poles imparted to the cylindrical portion of the magnet, and K_1 is a constant defined by $1.5 \leqq K_1 \leqq 2.5$.

4,547,759

COIL FORM

Erwin Müller, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 24, 1984, Ser. No. 603,466

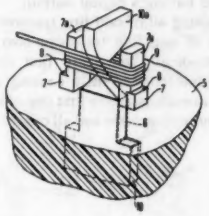
Claims priority, application Fed. Rep. of Germany, May 5, 1983, 3316456

Int. Cl.⁴ H01F *15/10*

U.S. Cl. 336—192 **6 Claims**

1. A winding on a coil form of insulating material comprising, a winding tube with a flange part, breakthroughs provided in the flange part, a plug-in fastening metallic connecting ele-

ment in each of the breakthroughs, retaining lugs molded-on to at least two opposite edge areas of each breakthrough of the



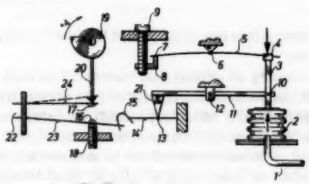
coil form being surrounded by a winding end, each lug being at least as wide as a part of the connecting element between them.

4,547,760

THERMOSTAT FOR REFRIGERATORS WITH A CONSTANT SWITCHING-ON AND ADJUSTABLE SWITCHING-OFF TEMPERATURE

Danilo Rejc, Cerkno, Yugoslavia, assignor to Eta Cerkno, Cerkno, Yugoslavia

Filed Jul. 9, 1984, Ser. No. 628,876
Claims priority, application Yugoslavia, Jul. 8, 1983, 1543/83
Int. Cl.⁴ H01H *37/12, 37/76*
U.S. Cl. 337—323 **3 Claims**



1. A thermostat for a refrigeration system for providing a constant switching-on temperature and an adjustable switching-off temperature comprising:

(I) switch-activating means for causing movement in response to a change in temperature in said refrigeration system, said switch-activating means comprising

(a) temperature-sensing means in said refrigeration system, said temperature-sensing means including a fluid expansion agent,

(b) bellow means (2) for activation by said temperature-sensing means,

(c) fluid conduit means (1) interconnecting the interior of said bellow means (2) with said temperature-sensing means,

(d) force-transmitting means (3) for resisting force exerted within said bellows (2), and

(e) adjustable force exerting means (5, 6, 7, 8) coupled to said force transmitting means (3),

(II) switching means comprising

(a) first electrical contact means (16) for a switch (22) mounted on first spring means (23),

(b) second electrical contact means (17) mounted on second spring means (24),

(c) means (18, 19) for separately adjusting the position of each of said contact means (16, 17) with respect to each other, and

(III) means operatively interconnecting said switch activating means with said switching means comprising

(a) spring lever means (11) supported at a point intermediate its ends by hinge means (12), connected at one end to said switch activating means to move in response to movement of said bellows (21), and

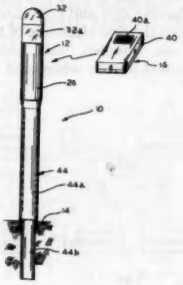
(b) spring means (14, 15) coupling said spring lever means (11) with said switching means.

4,547,761

DISTRESS LIGHT AND SIGNAL SYSTEM

Richard D. Jones, 1174 Highland Rd., Mundelein, Ill. 60060

Filed Dec. 9, 1983, Ser. No. 559,731
Int. Cl.⁴ G08B *5/36, 5/38*
U.S. Cl. 340—331 **5 Claims**



1. A distress signal system for guiding emergency personnel to a house in a rural location, comprising;

light means adapted to be mounted in proximity to a road passing by a house, said light means including a housing having a light source mounted therein, said light source comprising a revolving reflector light surrounded by a colored translucent sleeve;

said housing including an opaque tubular member with an upper end and a lower end, said tubular member having a platform at its upper end upon which said light source is mounted, said housing also including a clear dome releasably secured to said tubular member;

said light means further including a solar collector mounted in said clear dome, said tubular member having disposed therein a rechargeable battery operatively connected to said solar collector;

switch means for selectively actuating said light means in an emergency from within said house; and

means for retaining directional information at a location remote from said house so as to direct an emergency team to said house and to provide emergency information if necessary;

whereby an internally powered distress signal system for rural locations provides emergency personnel with directions to the site of the emergency and visually identifies an emergency location.

4,547,762

DIGITAL TO ANALOG CONVERTING APPARATUS

Masahiko Ono, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 310,317, Oct. 9, 1981, abandoned. This application Feb. 13, 1984, Ser. No. 578,607
Claims priority, application Japan, Nov. 13, 1980, 55-159929
Int. Cl.⁴ H03K *13/02*
U.S. Cl. 340—347 DA **2 Claims**

1. A digital to analog converting apparatus connectable to a power source, comprising:

comparison means having first and second input terminals for generating a comparison signal having a first value when the polarity of the difference between two input signals supplied to the first and second input terminals is positive and a second value when the polarity of said difference is negative, said first input terminal being adapted to receive a digital input signal;

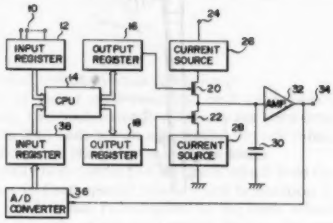
capacitor means;

a source of charging current for said capacitor means;

a switching element coupled to said comparison means and said source, said switching element being rendered conductive when said comparison signal has one of said first and second values and non-conductive when said comparison signal has the other of said first and second values;

a diode having one end connected at the node where said source and said switching element are connected;

a Darlington pair of transistors having a first electrode, a second electrode, and a third electrode, the first electrode being coupled to the other end of said diode, said capacitor means having one end connected at the node where said diode and the first electrode of the Darlington pair of transistors are coupled, said capacitor means being charged by said source when said switching element is



rendered conductive, and said capacitor means being discharged by the Darlington pair of transistors when said switching element is rendered non-conductive, the second electrode of the Darlington pair of transistors being coupled to the power source; and

analog to digital converting means coupled between the third electrode of the Darlington pair of transistors and the second input terminal of said comparison means for supplying to said second input terminal a digital signal, the value of which corresponds to the voltage of said capacitor means;

the digital to analog converting apparatus having an analog output coupled to the third electrode of the Darlington pair of transistors and a digital input coupled to said first input terminal of said comparison means.

4,547,763

MOS PARALLEL A/D CONVERTER

Peter M. Flamm, Freiburg, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 326,637, Dec. 2, 1981, Pat. No. 4,400,693. This application Jun. 10, 1983, Ser. No. 503,229

Claims priority, application European Pat. Off., Dec. 11, 1980, 80107811.4

The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.

Int. Cl.[4] H03K *13/175*

U.S. Cl. 340—347 CC **24 Claims**

1. A monolithic integrated analog-to-digital converter comprising:

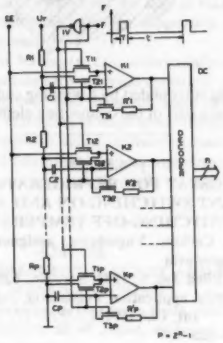
a terminal coupleable to a source of analog signals;

a plurality of reference signal points;

a plurality of comparator stages, each stage comprising: a comparator having a first input of a first type, a second input of a second type, and an output; a first transfer transistor having two conductive states and having its controlled current path connected between said terminal and said first input; a second transfer transistor having two conductive states and having its controlled current path connected between said first input and one of said plurality of reference signal points; capacitive means coupled between said second input and said one of said plurality of reference signal points; and a feedback path coupling said output to said second input, said feedback path comprising a third transfer transistor having two conductive states and having its controlled current path serially connected in said feedback path;

a decoder having inputs coupled to said comparator stage outputs and having a digital output;

means for causing all of said first transistors to each assume a first one of said first transistor two conductive states during periodically recurring first predetermined time intervals while concurrently causing all of said second transistors to each assume a first one of said second transistor two conductive states and all of said third transistors to



each assume a first one of said third transistor two conductive states;

means for causing all of said first transistors to each assume a second one of said first transistor two conductive states during periodically recurring second predetermined time intervals while concurrently causing all of said second transistors to assume a second one of said second transistor two conductive states and all of said third transistors to each assume a second one of said third transistor two conductive states.

4,547,764

PULSE WIDTH DECODER FOR DOUBLE FREQUENCY ENCODED SERIAL DATA

Bernardo Levy-Navarro, Ann Arbor, Mich., and Ensi P. Sylvernale, West Chester, Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 31, 1983, Ser. No. 547,382

Int. Cl.[4] H03K *13/24*

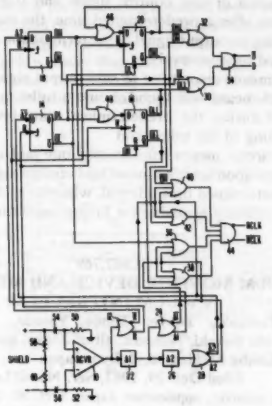
U.S. Cl. 340—347 DD **18 Claims**

1. A decoder circuit for deriving data and clock information from an inputted double frequency encoded waveform, comprising:

delay means, receiving said inputted waveform, for producing first and second delayed versions of said inputted waveform:

data recovery means, receiving the second delayed version of said inputted waveform, for recovering the data information from said inputted waveform; and

clock recovery means, receiving the first and second delayed versions of said inputted waveform and responsive



to said data recovery means, for recovering the clock information from said inputted waveform.

4,547,765

METHOD AND CIRCUIT ARRANGEMENT FOR TRANSLITERATION OF CODE WORDS

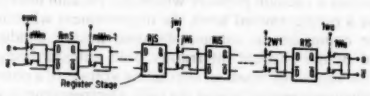
Frithjof Von Sichart, Munich, and Klaus Wiedeburg, Puchheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 31, 1983, Ser. No. 527,988

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1982, 3232548

Int. Cl.⁴ H04L *3/00*

U.S. Cl. 340—347 DD **5 Claims**



1. A method for transliterating code words of a code having m-place code words into the corresponding code words of a different code likewise having m-place code words, comprising the steps of:

forwarding individual bits of the code word to be transliterated in non-negated or negated fashion from register stage to register stage of a m-place shift register over a respective forwarding circuit associated with each register stage;

said forwarding occurring during serial input of said individual bits into said m-place shift register or during serial output from said m-place shift register;

said forwarding of said bits in a non-negated or negated fashion depending upon a measure or criterion of equality or non-equality of said individual bits and the bits of the corresponding code word of the different code; and

during said forwarding said bits respectively experiencing a negation in front of as well as after a register stage when a position of the register stage within the shift register stage corresponds to a position of non-equal bits within the two code words being compared.

4,547,766

A-TO-D CONVERTER OF THE SUCCESSIVE-APPROXIMATION TYPE

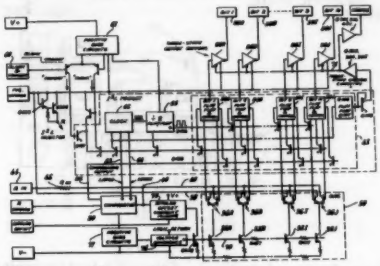
Adrian P. Brokaw, Burlington, and Modesto A. Maidique, Lexington, both of Mass., assignors to Analog Device, Incorporated, Norwood, Mass.

Division of Ser. No. 361,740, Mar. 25, 1982, which is a division of Ser. No. 931,960, Aug. 8, 1978, Pat. No. 4,400,689, which is a continuation-in-part of Ser. No. 785,322, Apr. 7, 1977, abandoned. This application Jul. 23, 1984, Ser. No. 633,298

The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.

Int. Cl.⁴ H03K *13/02, 13/08*

U.S. Cl. 340—347 AD **3 Claims**



1. In a monolithic integrated circuit, the combination of:

analog circuitry comprising a first group of normal-mode transistors and an output terminal;

said first group of normal-mode transistors each having first and second film electrodes;

first power supply terminal means connected to said normal mode transistors to supply operating current through said main electrodes thereof;

said first group of transistors having first circuit means operable therewith to control the flow of current through the main electrodes of one of said normal-mode transistors;

circuit means coupling said one transistor to said output terminal to develop thereon an output signal variable in accordance with changes in the flow of current through said one transistor;

said analog circuitry including a second group of normal mode transistors interconnected to perform a predetermined function;

said output terminal being coupled to said second group of normal mode transistors to provide an analog control signal therefor in accordance with said output signal;

I^2L inverted mode transistors forming logic circuitry producing a digital control signal to control the functioning of said second group of normal mode transistors;

second power supply terminal means for said inverted mode transistors;

voltage supply means; and

means connecting said first and second power supply terminals serially with said voltage supply means to provide that current flowing through and used in the operation of said first group of normal mode transistors is used also to power said I^2L logic circuitry.

4,547,767

PRINTED CIRCUIT BOARD FOR ACTIVATING AND DEACTIVATING ALARM SYSTEMS

David C. Steele, Granite Falls, N.C., assignor to Moose Products, Inc., Hickory, N.C.

Filed Oct. 11, 1983, Ser. No. 540,331

Int. Cl.⁴ G08B *23/00;* **H05K** *1/00*

U.S. Cl. 340—500 **5 Claims**

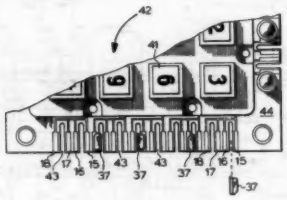
1. A dielectric board having two major surfaces and a circuit

on each of the surfaces for encoding an alarm means comprising:

(a) a logic means responsive to emit a predetermined output signal upon receipt of a predetermined sequence of electrical pulses, normally opened first and second switches adapted to be connected to an electrical potential having first and second contacts, and a common lead connecting the first contact of each switch with the logic means;

(b) a first lead for each switch disposed and terminating on one of the major surfaces in electrical communication with the second contact of the switch;

(c) second and third leads connected to the logic means, disposed and terminating on the other major surface of the dielectric board;



(e) a plurality of slots in the dielectric board beginning at the free edge of the board and continuing inwardly for a predetermined length, a terminal portion of the first, second and third leads lying parallel and adjacent to a portion of the longitudinal axis of the slots; and,

(f) a first "U-shaped" removable connector means inserted into one of the slots electrically connecting the terminal portion of the first lead of the first switch to either the terminal portion of either the second or the third lead and a second "U-shaped" removable connector means inserted in another slot electrically connecting the terminal portion of the first lead of the second switch to either the terminal portion of either the second or third leads not otherwise engaged by the first "U-shaped" connector.

4,547,768

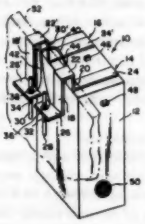
TOILET RESERVOIR FILL ALARM

Karel A. Kulhavy, P.O. Box 535, Bath, S. Dak. 57427

Filed Dec. 27, 1982, Ser. No. 453,709

Int. Cl.⁴ G08B *21/00*

U.S. Cl. 340—620 **19 Claims**



1. A toilet reservoir fill alarm system comprising: electronic water level sensing rods for positioning in the water reservoir tank of a flush toilet so as to at least partially extend into the water when at a desired level, and detecting the presence and absence of water at said desired level in the reservoir tank;

level adjusting means for adjusting the depth of extension of said sensing rods into the water tank so as to adjust said desired level;

switch means responsive to the water level sensors for providing a control signal during the absence of a desired level of water and terminating said control signal upon the presence of a desired water level;

capacitor timing means operative for charging up during the presence of said control signal and triggering a switch means after a predetermined time, the switch means producing an output signal at the termination of said predetermined time interval;

alarm means responsive to said output signal whereby said alarm means will sound should a toilet tank reservoir not refill during the predetermined time interval following flushing of the toilet; and

short circuit means for shorting out said capacitor timing means upon termination of said control signal prior to said predetermined time interval, whereby said alarm system is immediately available for further monitoring usage.

4,547,769

VACUUM MONITOR DEVICE AND METHOD FOR VACUUM INTERRUPTER

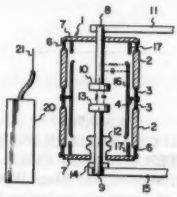
Shuzo Tanigaki, Tokyo; Tomio Yasuda, Kasukabe, and Masayuki Sakaki, Numazu, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Oct. 29, 1982, Ser. No. 437,678

Claims priority, application Japan, Oct. 30, 1981, 56-173887; Oct. 30, 1981, 56-173890; Jan. 29, 1982, 57-12674

Int. Cl.⁴ G08B *21/00*

U.S. Cl. 340—626 **23 Claims**



1. In a vacuum monitor for a vacuum interrupter, the interrupter including a fixed and a movable rod, to which rods a fixed and a movable contact are respectively joined, and also including a main shield within a tubular insulation housing, said vacuum monitor comprising a detection section for indicating when a vacuum pressure within the vacuum interrupter is above a predetermined level, the improvement wherein the monitor comprises an antenna disposed near a conductive material of the vacuum interrupter, said antenna being designed for receiving, when an alternating voltage of a commercial frequency is applied across the rods, electromagnetic wave signals composed of any superimposed electromagnetic signals including higher frequency components of 2 KHz or more, and wherein said detection section is connected to said antenna for electrically processing the electromagnetic wave signals received by said antenna, said detection section comprising a band-pass filter passing only the frequency components of the electromagnetic wave signals of 2 to 20 KHz which are generated by an electric discharge when the vacuum pressure increases within the vacuum interrupter above the predetermined level.

4,547,770

BATTERY VOLTAGE CHECKING APPARATUS

Ryoichi Suzuki, Kanagawa, and Ryuji Tokuda, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 1, 1983, Ser. No. 510,346

Claims priority, application Japan, Jul. 8, 1982, 57-11949

Int. Cl.⁴ G08B *21/00*; G03B *7/26*

U.S. Cl. 340—636 **7 Claims**

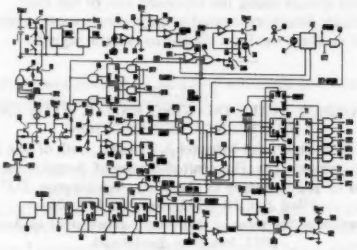
1. A battery voltage checking apparatus for an electrical system comprising:

(a) a first detector for producing a first electrical signal

indicative of a necessity for replacement of a battery used for the system when the output voltage of the battery drops to a value lower than a first voltage level;

(b) a second detector for producing a second electrical signal to inhibit operation of the system when the output voltage of the battery drops to a value lower than a second voltage level which is lower than the first voltage level;

(c) first circuit means functionally connected to the first and second detectors and for causing the first and second



detectors simultaneously to detect the output voltage of the battery; and

(d) memory means for electrically memorizing, during a predetermined length of time assoicated with an exposure cycle of a camera, the first and second electrical signals produced by the first and second detectors as a result of an operation of said first circuit means; and

(e) second circuit means connected to the memory means for processihg the memorized first electrical signal before the memorized second electrical signal is processed.

4,547,771

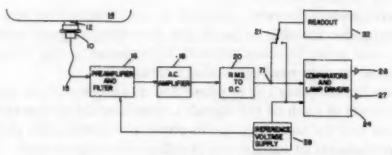
VIBRATION SENSOR

Robert E. Rockwood, Windham, N.H., and Victor Ximenes, Haverhill, Mass., assignors to A. W. Chesterton Company, Stoneham, Mass.

Filed Aug. 13, 1982, Ser. No. 408,044

Int. Cl.[4] G08B *23/00*

U.S. Cl. 340—683 **7 Claims**



1. An apparatus for indicating changes in the average level of vibrations in a vibrating object compared with a selected constant level of vibrations, said vibrating object being characterized in that said average level normally alternates above and below said constant level, spending equal amounts of time on either side of said selected constant level, said apparatus having a transducer for sensing said vibrations and means responsive to said transducer for determining said average level, the improvement wherein said means comprises

a storage element for holding a reference value corresponding to said selected level of said vibrations, and

compare and indicator means responsive to said storage element and said transducer for indicating the relationship between said average level and said reference value, said compare and indicator means having an indicator which alternates equally between two discrete perceptible states when said average level is alternating equally above and below said reference value, and any changes in said relationship are represented by changes in the relative proportion of time during which said indicator occupies each of said two states.

4,547,772

MULTICOORDINATE SENSING HEAD

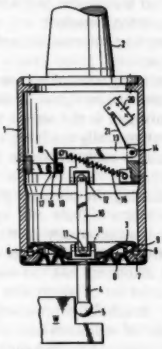
Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Aug. 11, 1983, Ser. No. 522,407

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1982, 3231158

Int. Cl.[4] G08B *21/00*

U.S. Cl. 340—686 **17 Claims**



1. In a multicoordinate sensing head comprising a housing, a sensing pin, means for mounting the pin in the housing such that the pin is deflectable in a plurality of directions and is returned to a predetermined rest position following deflection, and means for generating a deflection signal in response to deflection of the pin, the improvement comprising:

means for defining a cavity in the housing, said cavity sized to receive the pin; and

a linkage, included in the mounting means, for securing the pin to the housing such that the entire pin is movable into the cavity in response to extreme deflection of the pin in any direction of deflection.

4,547,773

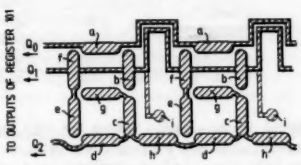
CHARACTER DISPLAY PANELS AND PANEL DEVICES

Michael G. Clark, Malvern, England, assignor to National Research Development Corporation, London, England

Filed Jan. 19, 1983, Ser. No. 459,083

Int. Cl.[4] G09G *3/16*

U.S. Cl. 340—765 **10 Claims**



1. A multi character electrically addressable display device, capable of displaying each one of a plurality of different display characters at a plurality of display locations, comprising:

(i) a layer of an electrically addressable medium;

(ii) two substrates spaced apart and containing said layer;

(iii) first and second sets of electrodes facing one another on said substrates at each character display location, the electrode sets collectively being in the form of segments providing display characters between facing pairs of segments; the first electrode set comprising a plurality of electrodes of which at least one electrode has connected thereto a group of at least two segments and at least one other electrode has connected thereto a group of at least one segment; the second electrode set comprising a plurality of electrodes each connected to at least one segment and each electrode being associated with no more than one segment from each group of segments in the first electrode set, the number of electrodes in the second set being at least equal in number to the greatest number of segments connected to any one electrode in the first set of electrodes, similar electrodes in successive display locations being connected together;

(iv) means for entering information relating to a required display character;

(v) means for generating a set of isogonal waveform signals wherein each waveform signal is different from every other waveform signal in the set;

(iv) means for simultaneously applying a different one of the waveform signals to each electrode in the second set of electrodes; and

(vii) means for selecting the phrase-waveform signals from said set of waveform signals and applying one of the selected signals simultaneously to each electrode in the first set of electrodes, said selection being related to the character to be displayed and the waveform signals applied to the second set of electrodes whereby a voltage above a display threshold is produced between each selected facing pair of segments and a voltage of substantially zero value appears between each nonselected pair of facing segments, to collectively display a desired character.

4,547,774

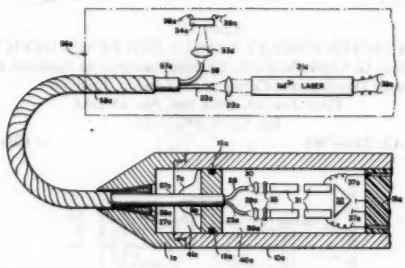
OPTICAL COMMUNICATION SYSTEM FOR DRILL HOLE LOGGING

Gordon Gould, Gaithersburg, Md., assignor to Optelcom, Inc., Gaithersburg, Md.

Continuation of Ser. No. 285,146, Jul. 20, 1981, abandoned. This application Sep. 13, 1984, Ser. No. 650,126

Int. Cl.⁴ G01V *1/40*

U.S. Cl. 340—854 **14 Claims**



1. An optical communication system for high temperature and high pressure drill hole logging comprising:

a. a laser light source which oscillates at a wavelength greater than 1 micrometer;

b. an armored cable;

c. at least one of a plurality of optical fibers in said armored cable for transmitting laser light down and up the drill hole;

d. cable head connector shell connected to the cable at the downhole end;

e. in the cable head connector shell, means for modulating the laser light with a data signal;

f. means for demodulating the data signals from the modulated laser light received at the upper end of the cable;

g. separate sources for each light signal positioned in the axle to radiate separate light beams at different radial distances from the axis to the axle;

h. separate, stationary, concentric, rotationally symmetric means for focusing the separate light beams to separate spots spaced along the extended axis of the axle;

i. separate detectors located at the separate spots to intercept and convert the light signals to electric signals.

4,547,775

FREQUENCY AGILE IMAGING RADAR WITH ERROR FREQUENCY CORRECTION

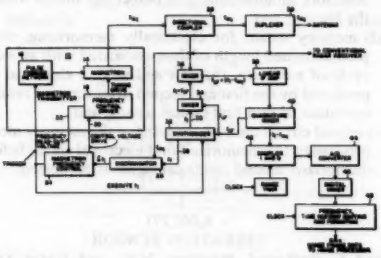
Donald R. Wehner, and Michael J. Prickett, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 18, 1982, Ser. No. 340,426

The portion of the term of this patent subsequent to Aug. 27, 2002, has been disclaimed.

Int. Cl.⁴ G01S *7/42, 13/89*

U.S. Cl. 343—17.2 R **17 Claims**



11. A radar signal generating and processing system comprising:

a magnetron transmitter including a magnetron and having a read-out voltage terminal said magnetron transmitter including a pulse forming network operably coupled to said magnetron; and

control means operably coupled to said magnetron and to said pulse forming network for providing trigger signals to said pulse forming network in response to the voltage signal on said read-out voltage terminal;

means for sampling the in-phase and quadrature phase components of each of the signals transmitted by said magnetron and for sampling the in-phase and quadrature phase components of each corresponding echo signal; and

means operably coupled to said sampling means for generating signals representing the amplitude and phase angle of each said echo signal.

4,547,776

LOOP ANTENNA WITH IMPROVED BALANCED FEED

Conway A. Bolt, Jr., Pasadena; John W. Cassen, Glen Burnie, and Helmut E. Schrank, Cockeysville, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

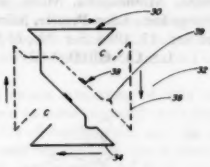
Filed Nov. 3, 1983, Ser. No. 548,468

Int. Cl.⁴ H01Q *11/14*

U.S. Cl. 343—741 **1 Claim**

1. An improved Alford loop radiating element of the type having four radiating segments in a square configuration, a pair of center fed terminals, and a cross-over connection on one side of the feed terminals with two parts of the loop being on opposite sides of a printed circuit board, the improvement comprising a kink in the loop path on the side of said printed

circuit board opposite said cross-over connection to add a path length equal to that of the crossed paths such that there is a



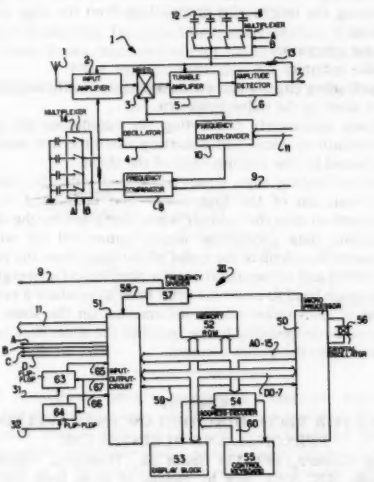
balanced power division at said feed terminals and equi-phase currents in said radiating segments.

4,547,777

METHOD OF RADIO-POSITION-FINDING THROUGH DETERMINATION OF PHASES OF ELECTROMAGNETIC WAVES AND RECEIVING DEVICE FOR PRACTICING THE METHOD

Christian Lamiraux, St Sebastien sur Loire, France, assignor to M.L.R. Electronique, France

Filed Feb. 9, 1982, Ser. No. 347,354
Claims priority, application France, Feb. 13, 1981, 81 02906
Int. Cl.[4] G01S 3/64
U.S. Cl. 343—394 **9 Claims**



1. A receiver device for radio-position-finding in which the position of a vehicle is determined by the intersection of an iso-phase shift hyperbola line of a first family of radio frequency waves with the iso-phase shift hyperbola line of a second family of radio frequency waves and advantageously by ambiguity-removing frequency waves, each family comprising a pair of fundamental radio frequency waves separated by a position-finding low frequency and a reference radio frequency wave modulated by the low frequency separating said fundamental waves and serving as a reference low frequency, the low frequencies of said families being different from one another, and wherein the low frequency position-finding frequency is developed from each pair of fundamental waves, the low reference frequency modulated thereon is developed from the reference radio frequency wave, the corresponding low frequencies are developed from said ambiguity-removing frequency waves, and the position of the vehicle is established by determining the relative phase between the position-finding low frequencies and the reference low frequencies of each family of radio frequency waves, and wherein said fundamental waves, said reference waves and said ambiguity-removing waves are received in successive cycles during predetermined successive time periods within each cycle, respectively, the relative phase of the corresponding low frequencies received sequentially and developed sequentially is established, and said relative phase values are corrected by computation by a correction value obtained by averaging the phase shift difference measured during each cycle on the same signal, said receiver device being used on a vehicle in order to determine the position thereof and being adapted to receive said two radio frequency wave families each comprising a pair of radio-position-finding frequency waves separated by a low frequency forming a position-finding low frequency and a reference radio wave modulated by said low frequency forming a reference low frequency, advantageously by ambiguity-removing frequency waves, said pairs of position-finding radio frequency waves being situated in a first frequency band, said reference radio frequency waves being situated in a second frequency band and said ambuiguity-removing frequency waves being situated in a third frequency band, said receiver device comprising a single receiver channel the tuning frequency of which is switchable over onto said different frequency bands during successive time periods and a microprocessor system adapted for controlling the switching of said receiver channel and for establishing said relative phase of each family of radio frequency waves and of the average phase shift differences forming said correction values and taking into account the shift in time of the measuring of the position-finding low frequencies with respect to the reference low frequencies due to the sequential switching of said single receiver channel on said different frequency bands and for correcting said relative phase values by said correction values, said receiving channel being an amplitude demodulating channel turnable successively to said various frequency waves under the control of said microprocessor device and being adapted to provide two low frequencies from both pairs of fundamental frequencies separated by a low frequency, a device for separating low frequencies being mounted downstream of said receiving channel whereas said logical microprocessor device comprises a clock signal generating oscillator, counter means for measuring the phases of the low frequency signals with respect to the phase of the clock signals and a central computation unit for delivering the phases representative of the hyperbolic position loci through correction of the measured values shifted in time.

4,547,778

METHOD AND APPARATUS FOR AUTOMATIC DISTRESS CALL SIGNAL TRANSMISSION

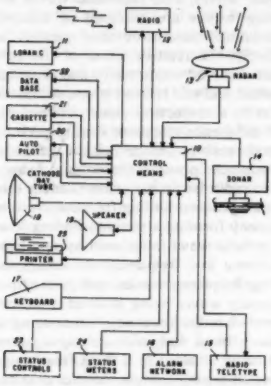
Robert W. Hinkle, and Michael O'Hagan, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 9, 1981, Ser. No. 271,915
Int. Cl.[4] G01S 3/02
U.S. Cl. 343—456 **5 Claims**

1. A method of automatically producing a distress call on board a craft comprising

(a) automatically monitoring an alarm network for an alarm signal and in response to said alarm signal, automatically;
(b) obtaining digitized absolute position information of said craft from a position determining means on board said craft;
(c) obtaining digitized information from a data bank informative of the craft identification and nature of the distress;
(d) determining the closest land based station and the prevailing language used by the station for the distress call;
(e) creating a distress call in the prevailing language of the closest land based station from the information and memory addresses therefor;
(f) coupling the addresses for the distress call to the memory of a speech synthesizer for producing the distress call in a

human speech using the prevailing language used by the closest land station; and



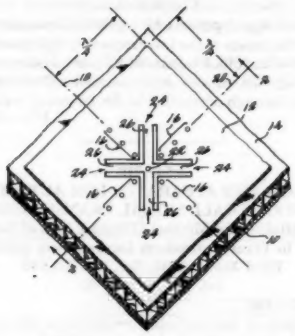
(g) activating a radio for radio transmission of the distress call in human speech using the prevailing language used by the closest land station.

4,547,779

ANNULAR SLOT ANTENNA

Gary G. Sanford, Boulder, and Dean A. Paschen, Lafayette, both of Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Feb. 10, 1983, Ser. No. 465,486
Int. Cl.[4] H01Q *1/38*
U.S. Cl. 343—700 MS **15 Claims**



1. A microstrip annular slot antenna having a vertically polarized approximately "doughnut" shaped monopole-type radiation pattern comprising:

a plurality of juxtaposed and arrayed quarter-wavelength resonant microstrip antenna structures having outwardly directed radiating apertures which together provide a composite annular radiating slot within an overall area less than the wavelength in its maximum dimension, and

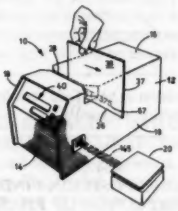
feed means disposed centrally of said arrayed structures for radially feeding commonly phased r.f. energy to/from each of said arrayed structures so as to produce said vertically polarized approximately "doughnut" shaped monopole-type radiation pattern.

4,547,780

PRINTER WITH MANUAL PAPER FEED AND WEIGH SCALE INCORPORATING THE SAME

Robert P. Cummins, Minneapolis, Minn., assignor to Fargo Electronic Services Inc., Eden Prairie, Minn.

Filed Sep. 17, 1984, Ser. No. 651,446
Int. Cl.[4] G01D *9/02*
U.S. Cl. 346—9 **6 Claims**



1. A printer for printing on cut sheets fed therethrough by hand comprising:

a stationary electronic matrix print head for printing alphanumeric information on said sheet,

a channel adjacent to the print head for at least partially enclosing the sheet and having a means for positioning the sheet such that engagement between one edge of said sheet and the channel establishes a base point for determining the height of a printed line from the edge of the sheet,

a pulse generator,

a pulse counter,

a first leading edge sensor means associated with the channel for starting the pulse generator,

a means operatively connecting the counter to the pulse generator to count pulses starting when the first sensor is actuated by the leading edge of the sheet,

a second leading edge sensor associated with the channel downstream of the first sensor and connected to the counter to stop the counter when energized by the sheet,

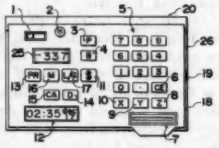
electronic data processing means connected (a) to the counter to calculate the speed of the sheet from the pulses counted and connected (b) to the print head for energizing the print head to cause the print head to produce a printed line of said alphanumeric information on the sheet at a speed corresponding to the speed of the sheet thus calculated from the pulses counted.

4,547,781

DEVICE FOR RECORDING DISTANCES TRAVELED ON PERSONAL AND BUSINESS USE

Carolyn Gelhorn, 1408-134 Smith St., Winnipeg, Manitoba, Canada (R3C 3W2, now by change of name from Carolyn Procter), and Michael P. Gulas, Winnipeg, Canada, assignors to Carolyn Gelhorn, Ile Des Chenes, Canada

Filed Apr. 25, 1983, Ser. No. 488,205
Int. Cl.[4] G01D *9/00*
U.S. Cl. 346—33 R **3 Claims**



1. A device for installing in a motor vehicle for calculating

and recording distances traveled distinguished between those undertaken for business purposes and those undertaken for nonbusiness purposes, the device comprising:

recording means;

first input means, means for connecting said first input means to said vehicle for automatically receiving therefrom an input indicative of a distance traveled by the vehicle on a journey;

second input means consisting of only two separate keys, one arranged to enter into said recording means a character indicative of business use and the other arranged to enter into said recording means a character indicative of nonbusiness use, said second input means arranged such that one of said two characters is entered into said recording means for all said journeys traveled by the vehicle;

third input means comprising a decimal key pad;

fourth input means for entering into said recording means in conjunction with said decimal key pad a code for further characterizing said journey;

fifth input means for entering into said recording means in conjunction with said decimal key pad details of fuel purchased for said vehicle;

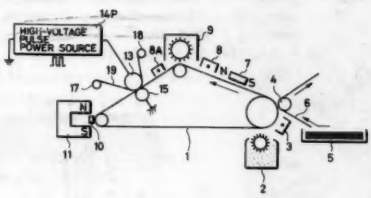
sixth input means comprising a clock for entering into said recording means in relation to said journey a time and date;

and printing means including paper supply means for printing on the paper the distance traveled together with the indicative character, code, fuel purchased, time and date.

4,547,782
MAGNETIC PRINTER

Akira Yamasawa; Teruhiko Itami, and Toshifumi Kimoto, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Japan

Filed Aug. 27, 1984, Ser. No. 644,271
Claims priority, application Japan, Oct. 6, 1983, 58-186012
Int. Cl.⁴ G01D *15/12*
U.S. Cl. 346—74.4 **3 Claims**

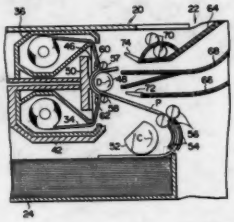


1. A magnetic printer, comprising a magnetic latent image carrier travelling in one direction along a predetermined path, magnet means disposed on said predetermined path and adapted to magnetize said magnetic latent image carrier uniformly in a predetermihed direction, a thermal print head device for heating said magnetic latent image carrier in image element units corresponding to given picture image signals thereby forming a magnetic latent image on said magnetic latent image carrier owing to thermoremanent magnetization, a developer for causing a developing agent to act on said magnetic latent image thereby converting said magnetic latent image into a visible image, means for transferring the visible image of said developing agent formed on said magnetic latent image carrier onto a sheet of plain paper, and cleaning means disposed between said thermal print head device and said means for transferring and adapted to remove any residual developing agent from said magnetic latent image carrier, charging said cleaning means comprising means for conferring electric charge of predetermined polarity upon said residual developing agent, a bias roll disposed as juxtaposed to said magnetic latent image carrier on a downstream side of said charging means, and a high-voltage pulse source for applying pulse voltage to said bias roll and allowing electrostatic force to act upon said residual developing agent on said magnetic latent image carrier while said magnetic latent image carrier is in the process of passing thereunder and thereby causing said residual developing agent to be attracted by said bias roll.

4,547,783
IMAGE FORMING APPARATUS

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 25, 1984, Ser. No. 664,690
Claims priority, application Japan, Oct. 31, 1983, 58-202642; Oct. 31, 1983, 58-203812
Int. Cl.⁴ B41J *3/20*
U.S. Cl. 346—76 PH **11 Claims**



1. An image forming apparatus for forming an image on a sheet by transferring a color medium from a transfer medium to the sheet over the full length thereof in a transfer position in accordance with an image pattern comprising:

a recording head for transferring the color medium from the transfer medium to the sheet in accordance with the image pattern;

a platen opposed to the recording head and supporting the sheet in the transfer position;

a pair of pressure means for pressing the sheet against the platen on either side of the transfer position, thereby holding the sheet in conjunction with the platen;

a pair of separating means located individually between the transfer position and the pair of pressure means and adapted to separate the transfer medium from the sheet; and

conveyance control means for controlling conveyance of the sheet between the recording head and the platen for reciprocation in the transfer position, said conveyance control means being adapted to convey the sheet, with the leading end portion thereof forward, in the forward direction through the transfer position at the time of transfer, so that the transfer medium is separated by one separating means from the sheet with the color medium transferred thereto from the transfer medium in the transfer position, and to convey the sheet in the backward direction after the color medium is transferred to the trailing end portion of the sheet, so that the transfer medium is separated from the transfer-printed trailing end portion of the sheet by the other separating means.

4,547,784
THERMAL RECORDING SYSTEM AND METHOD

Irving Erlichman, Wayland, and Robert W. Hausslein, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 24, 1984, Ser. No. 685,715
Int. Cl.⁴ B41J *3/20;* **B41M** *5/18*
U.S. Cl. 346—76 PH **11 Claims**

1. A thermal recording system for recording an image represented by pixel areas of varied density on a transparency type thermally sensitive recording medium having a transparent support layer and a transparent thermally sensitive recording layer of the type wherein recorded dot size increases with

increased amounts of thermal energy applied to form a dot, said recording system comprising:

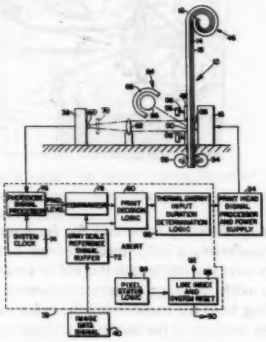
means for supporting such a transparency type of recording medium;

means for receiving image signals indicative of a desired density for each pixel area of the desired image;

means operable for applying thermal energy to selected areas of the recording layer to form a dot in each selected pixel area;

means, located between the recording layer and said energy applying means, for providing a contrasting, light reflective, background against which recorded dots may be viewed by reflected light;

means, configured to receive light reflected by said background, for optically monitoring said selected pixel areas



and for providing density signals indicative of the density of each selected pixel area;

means for comparing said density signals with said image signals and for providing density comparison value signals for each selected pixel area; and

means for operating said energy applying means, said operating means initially being responsive to said image signals for regulating an initial application of thermal energy to selected pixel areas to form in each a dot having an initial size smaller than necessary to achieve its said desired density and, thereafter, being responsive to said density comparison value signals for regulating further application of thermal energy to progressively increase dot size in each selected pixel area until a predetermined value of density comparison is achieved for each said selected pixel area.

4,547,785

APPARATUS AND METHOD FOR DROP DEFLECTION

David E. Jones, Layton, Utah, assignor to The Mead Corporation, Dayton, Ohio

Filed Apr. 23, 1984, Ser. No. 602,890

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—1.1 **18 Claims**

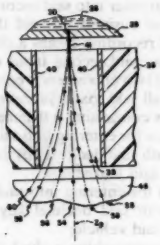
1. An ink jet printer for directing drops from a jet drop stream to a plurality of print positions on a print receiving medium, comprising:

print head means for generating a jet drop stream directed generally toward said print receiving medium, said stream emerging from said print head means as an electrically grounded fluid filament which breaks up into the stream of ink drops,

a pair of electrodes, said electrodes being positioned on opposite sides of said fluid filament above the point of drop formation and extending along the path of said jet drop stream for a substantial distance beyond the point of break up of said filament,

means for supplying a first deflection potential of a first polarity to a first of said pair of electrodes and for supplying a second deflection potential of a second polarity, opposite to said first polarity, to a second of said pair of electrodes such that an electric field between said pair of electrodes is produced, and

selective charging means for simultaneously shifting said first and second deflection potentials by equal amounts in



dependence upon the print position to which a drop then being formed is to be deflected, whereby drops are charged in dependence upon the field potential level at the end of said fluid filament, and a field of constant strength is maintained between said electrodes such that charged drops are laterally deflected in a manner which is unaffected by shifting of said first and second deflection potentials.

4,547,786

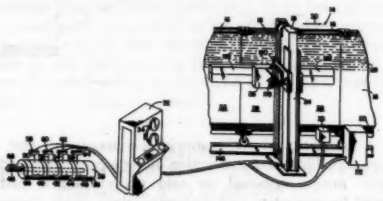
INK JET PRINTING SYSTEM

David J. Logan, Glastonbury; Kenneth O. Wood, Ellington; Thomas A. Gordon, Glastonbury, and John E. Ladue, Tolland, all of Conn., assignors to Metromedia, Inc., Secaucus, N.J.

Filed Aug. 2, 1984, Ser. No. 637,151

Int. Cl.[4] G01D *15/18, 15/34;* **H04N** *1/46*

U.S. Cl. 346—140 R **21 Claims**



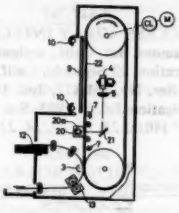
1. An ink jet printing system for printing onto a plurality of substantially flat panels, said system comprising: panel moving means for moving a plurality of flat panels in succession along an endless path, means providing an ink jet printing station located at one point along said endless path, said ink jet printing station having at least one ink jet printing head arranged and operable to sequentially eject drops of ink onto said panels as they move past said printing station so that as each panel passes said printing station said ink jet head scans a scan line on said panel extending parallel to said path of panel movement along which ink drops will appear if said ink jet head is operated to eject ink drops onto said panel at that time, and means for moving said at least one ink jet printer head in the direction perpendicular to said path of panel movement and in coordination with the movement of said panel moving means so that each time a panel passes said printing station said at least one ink jet head scans a new scan line on said panel.

4,547,787

IMAGE FORMING APPARATUS WITH DISPLAYING AND PRINTING FUNCTIONS

Shuzo Kaneko, Tokyo, and Yasuyuki Tamura, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 19, 1983, Ser. No. 459,132
Claims priority, application Japan, Jan. 25, 1982, 57-9870
Int. Cl.[4] G01D 15/14, 15/06
U.S. Cl. 346—160 10 Claims



1. An image forming apparatus having displaying and printing functions and comprising:

an image bearing member movable in opposing first and second directions;

recording means for forming an erasable visible image on a surface of said image bearing member in a direction substantially perpendicular to the first and second directions of movement of said image bearing member;

drive means for moving said image bearing member when an image is formed thereon by said recording means, said drive means being operative in a display mode to move said image bearing member in said first direction and being operative in a print mode to move said image bearing member in said second direction;

display means for visually displaying the visible image in the form of a positive image on said image bearing member and formed by said drive means moving said image bearing member in said first direction; and

transfer means for conveying a transfer material to the surface of said image bearing member on which a mirror image has been formed by said drive means moving said image bearing member in said second direction and for transferring to the transfer material the visible mirror image from said image bearing member.

4,547,788

THERMOSENSITIVE IMAGE TRANSFER MEDIUM

Norio Kurisu, Numazu, and Keishi Kubo, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jul. 21, 1983, Ser. No. 516,180
Claims priority, application Japan, Aug. 11, 1982, 57-139347
Int. Cl.[4] B41M 5/22
U.S. Cl. 346—208 22 Claims

1. A thermosensitive image transfer medium comprising:

an image transfer sheet having an image transfer layer comprising a leuco dye; and

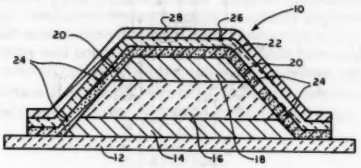
an acceptor sheet having an acceptor layer comprising a coloring agent which induces color formation in said leuco dye, and, at least one of said image transfer layer and said acceptor layer, further contains a porous filler having an oil absorption of 50 ml/100 g or more as measured in accordance with the Japanese Industrial Standard K 5101.

4,547,789

HIGH CURRENT THIN FILM TRANSISTOR

Vincent D. Cannella, Detroit; Gregory L. Hansell, Ann Arbor, both of Mich.; Zvi Yaniv, Beer-Sheva, Israel, and Meera Vijan, Troy, Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Nov. 8, 1983, Ser. No. 549,978
Int. Cl.[4] H01L 29/78
U.S. Cl. 357—23.7 41 Claims



1. A thin film field effect transistor of the type formed on a substantially planar substrate, said transistor comprising:

a plurality of layers, said plurality of layers being contiguous and formed over said substrate to form a drain region layer, a source region layer and an electrically insulating layer between said source and drain region layers;

said plurality of layers having edge portions forming a plurality of surfaces which are non-parallel to said substrate;

a deposited semiconductor material layer overlying said non-parallel surfaces and electrically coupled to said drain region layer and said source region layer along said non-parallel surfaces for forming a plurality of current conduction channels therebetween;

a gate insulator disposed over said deposited semiconductor material layer; and

a gate electrode separated from said deposited semiconductor material layer by said gate insulator.

28. A thin film field effect transistor of the type including a substrate, said transistor comprising:

a plurality of layers of deposited material, said layers being contiguous and forming a drain region layer, a source region layer and an electrically insulating layer between said drain and source region layers;

said drain region layer, source region layer, and electrically insulating layer forming a plurality of adjacently extending surfaces which are non-parallel to said substrate;

a plurality of regions of deposited semiconductor material extending over said adjacently extending non-parallel surfaces to form a plurality of field controlled current conducting paths between said source region layer and drain region layer;

a gate insulator overlying said regions of deposited semiconductor material; and

a gate electrode overlying said gate insulator.

4,547,790

SEMICONDUCTOR DEVICE HAVING CONTACTING BUT ELECTRICALLY ISOLATED REGIONS OF OPPOSITE CONDUCTIVITY TYPES

Hideharu Egawa, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 265,590, May 20, 1981, abandoned.
This application Aug. 6, 1984, Ser. No. 637,704
Claims priority, application Japan, May 20, 1980, 55-66971; May 20, 1980, 55-66972
Int. Cl.[4] H01L 29/06, 27/02, 27/04, 29/78
U.S. Cl. 357—42 30 Claims

1. A semiconductor device comprising:

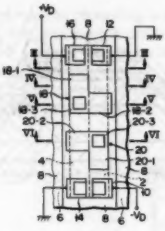
an insulating body formed of substantially an insulating material;

a p-type semiconductor region formed on said insulating

body and constituting at least part of a first semiconductor circuit section;

an n-type semiconductor region formed on said insulating body and constituting at least part of a second semiconductor circuit section, at least part of said n-type semiconductor region being in contact with said p-type semiconductor region;

first potential setting means connected to said p-type semi-



conductor region to set the p-type semiconductor region at a first predetermined operation potential; and

second potential setting means connected to said n-type semiconductor region to set the n-type semiconductor region at a second preferred operation potential higher than the first predetermined operation potential, thereby electrically isolating said p-type and said n-type semiconductor regions from each other.

4,547,791

CMOS-BIPOLAR DARLINGTON DEVICE

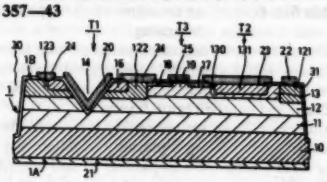
Bernard P. Roger, Carpiquet, and Bernard Vertongen, Caen, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 22, 1982, Ser. No. 360,291

Claims priority, application France, Apr. 29, 1981, 81 08550

Int. Cl.⁴ H01L *27/06, 29/78, 29/70*

U.S. Cl. 357—43 **3 Claims**



1. A semiconductor device having a semiconductor body comprising a monolithic integrated Darlington circuit having an input first transistor and an output second transistor, said first transistor being formed by a vertical enhancement insulated gate field effect transistor of the VMOST-type, and said second transistor being a vertical bipolar power transistor, characterized in that the device comprises a third transistor formed by a lateral enhancement insulated gate field effect transistor of complementary conductivity type to said first transistor, said third transistor being connected in parallel with an emitter-base junction of said second transistor, and said gate electrodes of said first and third transistors being interconnected, characterized in that said semiconductor body comprises a substrate region of a first conductivity type on which there are successively provided a first epitaxial layer of the opposite second conductivity type and a second epitaxial layer of said first conductivity type, wherein said substrate region forms a drain zone of said first transistor and a collector zone of said second transistor, wherein said first epitaxial layer forms a base zone of said second transistor, and an emitter zone of said second transistor is formed by a part of said second epitaxial layer, said part surrounding a more highly doped surface zone of said first conductivity type, said base zone of said second transistor being connected to the surface by connection zones of said second conductivity type, one of said connection zones surrounding a surface-adjoining source zone of said first conductivity type of said first transistor, wherein a groove intersects said source zone and connection zone and said groove extends into said substrate region, said groove being lined with an insulating layer on which a gate electrode is provided, and wherein said source and drain zones of said third transistor are formed by first and second surface zones of said second conductivity type, said first surface zone adjoining a connection zone.

4,547,792

SELECTIVE ACCESS ARRAY INTEGRATED CIRCUIT

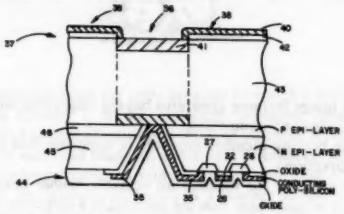
Nathan Sclar, Diamond Bar, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 161,177, Jun. 19, 1980, abandoned.

This application Jul. 8, 1983, Ser. No. 495,361

Int. Cl.⁴ H01L *27/10, 27/14, 31/00, 27/02*

U.S. Cl. 357—45 **9 Claims**



1. A selective access array integrated circuit comprising:

a common body of semiconductor material having a first and a second major surface;

a plurality of electronic devices implemented in a first array on said first major surface, each one of said electronic devices capable of transferring information which changes over a period of time;

a plurality of electronic access elements implemented in a second array, each access element corresponding to at least one of said electronic devices in said first array;

a plurality of signal output pads disposed on the periphery of said second major surface of said body for connection to corresponding respective ones of said electronic devices for simultaneous receiving data from said ones of electronic devices and simultaneously transferring such data externally of said circuit in a non-sequential, parallel data manner, and

access means connected to electronic access elements for selectively providing an access signal for continuously and simultaneously accessing predetermined ones of said electronic devices, and forming and maintaining a plurality of electrical readout paths from a selectively determined plurality of ones of said electronic devices to respective ones of said output pads for a predetermined period of time which is independent of any internal operative characteristic of said array circuit.

4,547,793

TRENCH-DEFINED SEMICONDUCTOR STRUCTURE

David L. Bergeron, Winooski, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1983, Ser. No. 565,678

Int. Cl.⁴ H01L *27/04, 27/12, 29/72, 29/06*

U.S. Cl. 357—50 **15 Claims**

13. A PNP bipolar transistor structure comprising

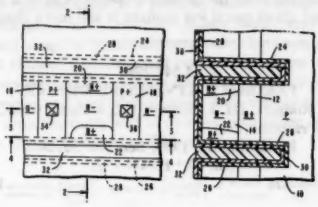
a semicopductor substrate having a buried region,

a trench disposed within said substrate extending from the surface thereof through said buried region,

a negative charge source disposed within said trench, and

emitter, base and collector regions butted against said trench, said base region including an N+ doped segment

disposed against said trench and extending from the surface of said substrate to said buried region, said N+ doped



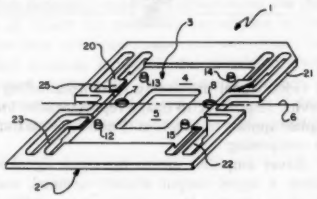
segment having a higher doping concentration than that of the principal portion of said base region.

4,547,794

REUSABLE FIXTURE FOR HOLDING A SEGMENT OF A FLEXIBLE STRIP

Ching-Chiang Tang, Hayward, Calif., assignor to Amdahl Corporation, Sunnyvale, Calif.

Filed Oct. 17, 1984, Ser. No. 661,965
Int. Cl.[4] H01L *23/48, 23/02;* **H02G** *13/08;* **B32B** *3/30*
U.S. Cl. 357—70 **18 Claims**



1. A fixture comprising:

a body member having a cavity for receiving a segment of a flexible strip during fabrication of an integrated circuit device; and

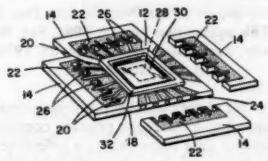
an elongated movable beam member which extends from said body member in a cantilever fashion in a direction parallel to an edge of said cavity and is movable between a first and a second position, said beam member having a free end which extends over an edge of said cavity for retaining a segment of a flexible strip received therein when said beam member is in its first position.

4,547,795

LEADLESS CHIP CARRIER WITH FRANGIBLE SHORTING BARS

Richard W. Wulff, Riverside, Calif., assignor to Bourns, Inc., Riverside, Calif.

Filed Mar. 24, 1983, Ser. No. 478,591
Int. Cl.[4] H01L *23/14, 23/48, 23/12*
U.S. Cl. 357—80 **5 Claims**



1. A packaged semiconductor device, of the type having an semiconductor chip installed on a ceramic substrate, said substrate having a main body portion bounded by a plurality of peripheral edges, and a plurality of conductive paths on a major surface of said main body portion, each of said paths extending from the proximity of said chip to an end located at one of said peripheral edges, wherein the improvement comprises:

a substrate extension portion formed as an integral part of said substrate and having a surface substantially coplanar with said major surface, said extension portion extending from and frangibly joined to said substrate main body portion along an adjacent one of said peripheral edges to which at least two of said conductive paths extend; and

conductive means on said surface of said extension portion and interconnecting the ends of at least two of said conductive paths located at said adjacent peripheral edge, said conductive means being substantially coplanar with said interconnected ends of said conductive paths;

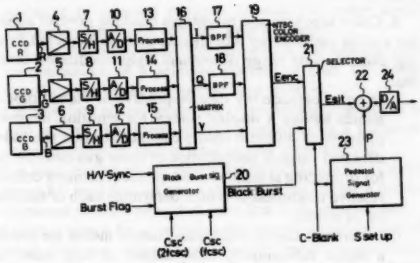
whereby said conductive means is separable from said interconnected paths when the underlying substrate extension portion is frangibly separated from said substrate main body portion along said adjacent peripheral edge.

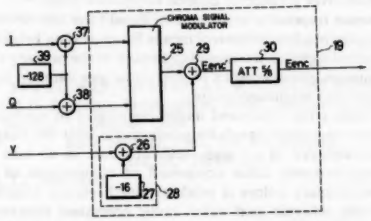
4,547,796

DIGITAL COLOR VIDEO SIGNAL ENCODER

Seiichiro Iwase; Takashi Asaida, and Fumio Nagumo, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 22, 1983, Ser. No. 506,699
Claims priority, application Japan, Jun. 28, 1982, 57-111066
Int. Cl.[4] H04N *9/38*
U.S. Cl. 358—13 **12 Claims**





1. A digital encoder for use with digital luminance and chrominance signals having black levels and each being constituted by n bit words, said encoder comprising:

level adjusting means for adjusting said chrominance and luminance signals to establish a predetermined relationship between said black levels of the level-adjusted chrominance and luminance signals;

chrominance signal modulating means for generating a modulated chrominance signal from said level-adjusted chrominance signal;

adding means receiving said modulated chrominance signal and said level-adjusted luminance signal and providing an encoded color video signal therefrom within a dynamic range limited by the number n of the bits in said words;

attenuator means for attenuating said encoded color video signal; and

means for combining sync and burst signals with the attenuated encoded color video signal and with a predetermined

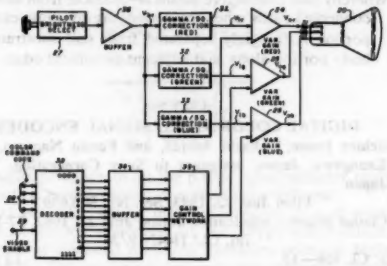
pedestal level to provide a level-adjusted composite color video signal within said dynamic range and constituted by n bit words.

4,547,797

APPARATUS FOR COLOR TRACKING AND BRIGHTNESS CORRECTION FOR MULTI-GUN COLOR CATHODE RAY TUBE DISPLAY

Perry J. Mick, Phoenix, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Oct. 12, 1982, Ser. No. 433,934
Int. Cl.[4] H04N 9/535
U.S. Cl. 358—27 **12 Claims**



1. Color selection and brightness tracking control apparatus for a color cathode ray tube display system subjected to viewing under a wide range of ambient light conditions, comprising:

(a) a color cathode ray tube responsive to video color commands having a display screen for emitting images in a plurality of different colors dependent upon the independent and variable energization of color gun cathode means for producing at least two independent primary colors, the relative brightness of which determine each of said plurality of colors,

(b) reference display brightness control means for providing a signal substantially independent of said video color commands for setting variable brightness energization levels over a range of desired brightness levels,

(c) means responsive to a common signal from said reference display brightness control means for providing brightness control signals corresponding to each of the primary color emission characteristics of said color gun cathode means over said brightness range,

(d) video color command means responsive to randum on color command signals for producing at least one image to be displayed at a video frequency rate in at least one predetermined color comprised of components of said two primary colors at predetermined relative brightness levels, wherein said video color command operates at video frequency and said means for providing a brightness control signal operates at substantially less than said video frequency, and

(e) combining means responsive to said video color command means and said brightness control signal for energizing said cathode means, thereby producing said predetermined color image at said reference brightness level.

4,547,798

SOLID-STATE COLOR IMAGING DEVICE AND THE PREPARATION OF SAME

Kenji Matsumoto, Kaisei; Shoichi Yamamoto, and Jun Hayashi, both of Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co. Ltd., Japan

Filed Nov. 30, 1983, Ser. No. 556,540
Claims priority, application Japan, Nov. 30, 1982, 57-208563
Int. Cl.[4] H04N 9/04, 9/07; G02B 5/22; G03C 7/04
U.S. Cl. 358—44 **4 Claims**

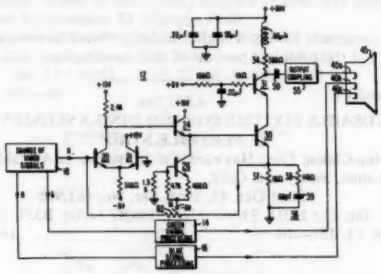
1. A solid-state imaging device provided with at least one hardened-protein layer thereon characterized in that said hardened-protein layer is made of a photohardening water-soluble protein selected from the group consisting of gelatin and casein whose total alkali metal ion content is not more than 20 ppm.

4,547,799

FEEDBACK KINESCOPE DRIVER

Robert L. Rodgers, III, Lancaster, Pa., assignor to RCA Corporation, Princeton, N.J.

Filed May 31, 1983, Ser. No. 532,335
Int. Cl.[4] H04N 9/20
U.S. Cl. 358—74 **10 Claims**



1. In a video signal processing system including an image display device responsive to image representative video information signals applied to an intensity control electrode thereof, apparatus comprising:

display driver amplifier means having a signal input first terminal, a signal output second terminal, and a third terminal at which a low impedance is exhibited by said amplifier means; said second and third terminals defining a main current path of said amplifier means;

input circuit means for providing image representative video signals to said first terminal of said amplifier means;

impedance means for coupling said third terminal of said amplifier means to a reference potential, said impedance means including resistive and reactive circuit means for increasing the current conducted by said amplifier means at high video signal frequencies;

output circuit means for providing video signals derived from said second terminal of said amplifier means to said intensity control electrode of said image display device; and

feedback means coupled from said third terminal of said amplifier means to said input circuit means to form a degenerative video signal feedback loop.

4,547,800

POSITION DETECTING METHOD AND APPARATUS

Ichiro Masaki, Brookfield, Conn., assignor to Unimation, Inc., Danbury, Conn.

Continuation-in-part of Ser. No. 106,039, Dec. 21, 1979, abandoned. This application Mar. 2, 1981, Ser. No. 239,621
Claims priority, application Japan, Dec. 25, 1978, 53-160464
Int. Cl.[4] H04M 7/18
U.S. Cl. 358—107 **70 Claims**

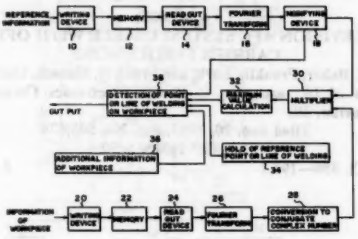
1. Apparatus for detecting the positional deviation of an object with respect to a reference position comprising:

means for storing data representing a reference image in a data array format of data elements with the object at a reference position;

object image storing means for acquiring and storing data representing an image of the object in a data array format of data elements;

means responsive to said stored data in said reference image storing means and said object image storing means for

comparing respective corresponding portions of said reference image and said object image on a data element by data element basis at a predetermined number of shifted positions of said reference image with respect to said object image .o obtain the correlation between said data at said shifted positions, said comparing means comprising means for serially reading out said reference image data elements and said object image data elements and means for simultaneously and in parallel calculating the correlation for each of said shifted positions; and



deviation detecting means for determining the shifted position at which the maximum correlation is obtained between said reference image and said object image, said shifted position at which the maximum correlation is obtained representing the deviation between said reference position and said object position, said deviation detecting means being responsive to said comparing means.

4,547,801

TUNABLE FABRY-PEROT INTERFEROMETER AND X-RAY DISPLAY DEVICE HAVING SUCH AN INTERFEROMETER

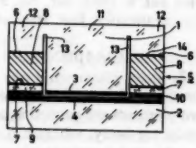
Jan Haisma; Cornelis L. Adema; Johannes M. M. Pasmans, and Jurren H. Walters, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,233

Claims priority, application Netherlands, Mar. 24, 1982, 8201222

Int. Cl.⁴ G02B *5/28*

U.S. Cl. 358—111 **12 Claims**



1. A Fabry-Perot interferometer having a tunable transmission wavelength and comprising two facing mirrors which are situated at a very small distance from each other and extend at right angles to the axis of said interferometer, said mirrors being provided on supports, said supports being interconnected by means of an axially continuously adjustable spacing element, characterized in that said supports consists of bundles of optical fibers and said mirrors are provided on ends of said optical fibers.

4,547,802

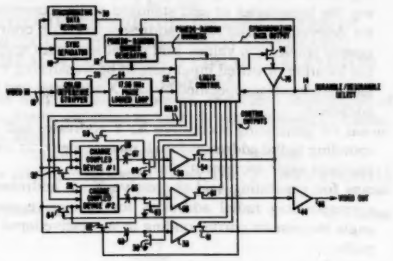
TV SCRAMBLER/DESCRAMBLER USING SERIAL MEMORIES

John D. Fogarty, Columbia, Md., and Gerald M. Borsuk, Washington, D.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 29, 1983, Ser. No. 490,263

Int. Cl.⁴ H04N *7/16*; H04K *1/06*

U.S. Cl. 358—119 **8 Claims**



1. Apparatus for scrambling a TV video signal comprising:

(a) at least first serial storage means for storing data representative of selected portions of said TV video signal during at least a first selected time interval;

(b) at least second serial storage means for storing data representative of a selected portion of said TV video signal during at least a second time interval;

(c) at least first circuit means for recirculating data stored in said at least first serial storage means during a predetermined portion of said at least second time interval;

(d) at least second circuit means for recirculating data stored in said at least second serial storage means during a predetermined portion of said at least first time interval; and

(e) circuit means for combining the output signals of said at least first and second serial storage means respectively during said at least first and second time intervals with the synchronizing data of said video signal to produce a scrambled video signal.

4,547,803

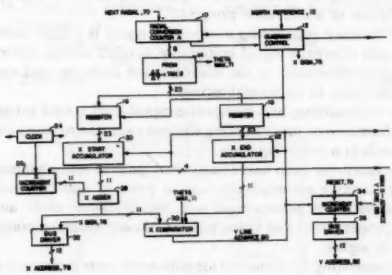
PPI TO RASTER DISPLAY SCAN CONVERTER

Gerald P. Richards, Framingham, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 27, 1981, Ser. No. 325,448

Int. Cl.⁴ H04N *5/02*

U.S. Cl. 358—140 **54 Claims**



1. In combination:

means for generating a plurality of X addresses to specify picture elements on a raster display during a conversion of

data defined by R, θ polar coordinates to data defined by X, Y cartesian coordinates;

means for generating a plurality of Y addresses to specify said picture elements on a raster display during said conversion;

means for generating radial addresses corresponding to an ordered sequence of picture element addresses within a standard angle increment on a raster display said generating means comprising accumulating means for determining the boundaries of said standard angle increment and for determining said radial addresses based on coordinate system conversion values, said radial addresses specifying the location of stored input data to be transferred to mass memory locations specified by said X addresses and said Y addresses;

means for generating successive X, Y addresses and corresponding radial addresses for all picture elements within a standard angle increment; and

means for generating said successive X, Y addresses and corresponding radial addresses for successive standard angle increments corresponding to successive input radial paths.

4,547,804

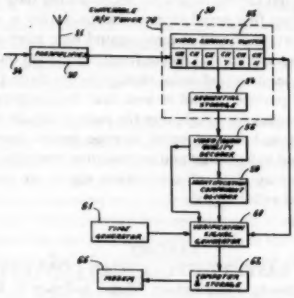
METHOD AND APPARATUS FOR THE AUTOMATIC IDENTIFICATION AND VERIFICATION OF COMMERCIAL BROADCAST PROGRAMS

Burton L. Greenberg, 28 E. 10th St., New York, N.Y. 10003

Filed Mar. 21, 1983, Ser. No. 476,915

Int. Cl.[4] H04N *7/08, 7/00*

U.S. Cl. 358—142 **18 Claims**



1. A method for automatically identifying and verifying the proper airing of a television program comprising:

(a) placing an identification code on a select line of each frame of a television program;

(b) forming and storing a reference signal in a first memory said reference signal containing verified airings information referenced to the identification code on said coded program to be bought airings,

(c) transmitting, as a composite signal, said coded program from one or more sending stations over one or more channels in a receiving area;

(d) receiving each said composite signal of said channels;

(e) scanning automatically one or more of said channels to detect the presence of said identification code and a proper audio and video portion of each received composite signal;

(f) separating the detected identification code from each said received composite signal;

(g) generating an electrical time signal;

(h) generating a channel identifying signal;

(i) forming a separate verification signal for each separated identification code by combining said separated identification code, said time signal and said channel identification signal;

(j) storing each said verification signal in a second memory as said verified airings, and

(k) playing out of said first and second memories the information stored therein to compare and match said verified airings with the bought airings and making therefrom a list of the number of verified airings that were bought airings and the number of bought airings for which there is no verified airing.

4,547,805

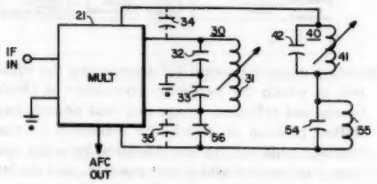
TELEVISION AFC SYSTEM USABLE WITH OFFSET CARRIER FREQUENCIES

Roy F. Baker, Franklin Park, and Frank G. Banach, Oak Lawn, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Jun. 20, 1983, Ser. No. 505,576

Int. Cl.[4] H04N *5/50*

U.S. Cl. 358—195.1 **5 Claims**



1. An AFC circuit comprising a multiplier, a limiter tuned circuit and a discriminator coil circuit including a single tuned circuit for processing both normal television signals and television signals having offset carrier frequencies, said AFC circuit having a response characteristic including a first portion of one polarity intermediate second and third substantially equal portions of opposite polarity with the zero crossing between said first portion of said second portion occurring at the normal IF picture carrier frequency and the zero crossing between said first portion and said third portion occurring approximately midway between the normal IF picture carrier frequency and the normal IF sound carrier frequency.

4,547,806

TWO-DIMENSIONAL SEMICONDUCTOR IMAGE SENSOR AND METHOD OF OPERATING THE SAME

Heiner Herbst, Haar, and Rudolf Koch, Unterhaching, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 8, 1983, Ser. No. 511,839

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1982, 3236146

Int. Cl.[4] H04N *5/30*

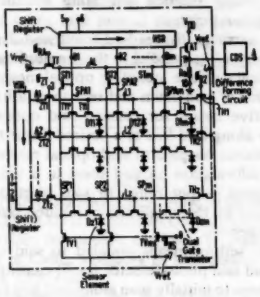
U.S. Cl. 358—212 **8 Claims**

1. In a two-dimensional image sensor of the type wherein a plurality of sensor elements are carried in columns and rows by a doped semiconductor body, wherein row lines are selected by way of assigned parallel outputs of a row shift register to selectively drive first switching transistors connected to the sensor elements for transmitting exposure-dependent sensor signals, formed in the sensor elements, over the first switching transistors to respective column lines, wherein the column lines are successively connected to a readout line connected to a read output for reading the sensor signals via respective column read-out second switching transistors driven by parallel outputs of a column shift register, the improvement therein comprising:

a plurality of third switching transistors each connected in series with a respective first switching transistor and con-

nected to and operated by a respective output of the column shift register;

a plurality of clock-driven fourth switching transistors each connecting a respective row line to a respective output of the row shift register; and



a difference-forming stage connected to the read-output and operable to produce a difference signal from two successive read sensor signals.

4,547,807

CCD IMAGER

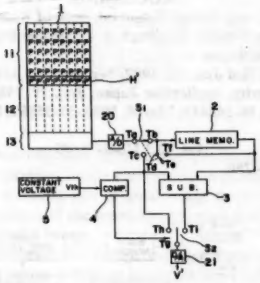
Nobuhiro Mitani, Ogaki, and Toshihiro Furusawa, Gifu, both of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 20, 1984, Ser. No. 673,252

Claims priority, application Japan, Nov. 22, 1983, 58-219784

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—213 **1 Claim**



1. A CCD imager comprising:

CCD (1) having a plurality of photoelectric transducers (P) aligned vertically and horizontally, with at least one horizontal line (H') being masked, said CCD (1) producing unmasked horizontal line signals obtained from unmasked horizontal lines and masked horizontal line signal obtained from said masked horizontal line;

a line memory (2) for storing said masked horizontal line signal and for producing said masked horizontal line signal repeatedly and serially;

a subtracter (3) for subtracting said masked horizontal line signal from each unmasked horizontal line signal and for producing a subtracted signal;

a constant voltage source (5) for producing a threshold voltage;

a comparator for comparing said unmasked horizontal line signal with said threshold voltage and for producing a first signal when said unmasked horizontal line signal is below said threshold voltage and a second signal when the same is above said threshold voltage;

A switch means coupled to said comparator for permitting said subtracted signal to pass therethrough when said first signal is produced, and for permitting said unmasked horizontal line signal to pass therethrough when said second signal is produced.

4,547,808

PHOTOMETRIC CIRCUIT INCORPORATED IN OBJECTIVE PROVIDED WITH AUTOMATIC DIAPHRAGM FOR CLOSED CIRCUIT TELEVISION (CCTV) CAMERA

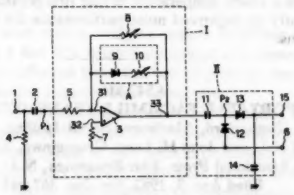
Masayuki Arai; Terumi Ogasawara, and Tohru Shikano, all of Tokyo, Japan, assignors to Asahi Seimitsu Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1983, Ser. No. 505,460

Claims priority, application Japan, Dec. 27, 1982, 57-234113

Int. Cl.[4] H04N *5/26*

U.S. Cl. 358—228 **3 Claims**



1. An automatic control circuit for opening and closing the diaphragm of the objective lens of a video camera comprising:

inverting amplifier means for receiving video signals output from said video camera and amplifying and inverting said signals;

voltage doubler means for doubling and rectifying the signals output from said inverting amplifier means;

reference signal generating means;

diaphragm control means for comparing said reference signal with signals output from said voltage doubler means and opening or closing said diaphragm in response to the results of the comparison;

means for clipping the negative going portion of signals output from said inverting amplifier; and

light mode selector means for adjusting said means for clipping to control the degree of clipping performed on said signals.

4,547,809

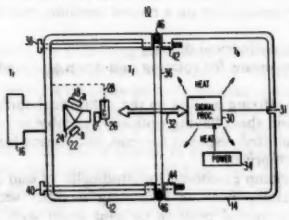
THERMALLY ISOLATED IMAGER

Peter D. Southgate, Princeton, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Apr. 27, 1984, Ser. No. 604,974

Int. Cl.[4] H04N *9/09*

U.S. Cl. 358—229 **6 Claims**



1. An improved television camera comprising:

solid-state imaging means for generating image-representative signals in response to radiant energy received from a scene;

signal processing means electrically coupled to said imaging means for generating video signal from said image representative signals;

energization means coupled to said imaging means and said signal processing means for energization thereof; and

a camera housing for supporting and enclosing said imaging means, signal processing means and said energization means, wherein the energization of said signal processing means generates heat causing a temperature rise within said housing which is sufficient to degrade the noise performance of said imaging means, the improvement comprising:

thermal isolation means forming a thermal barrier in said housing for dividing said housing into a first portion associated with said imaging means and a second portion associated with said signal processing and energization means, thereby reducing the thermal coupling of heat from said second to said first housing portions and resulting in a lower temperature in said first portion and consequently an improved noise performance for said imaging means.

4,547,810

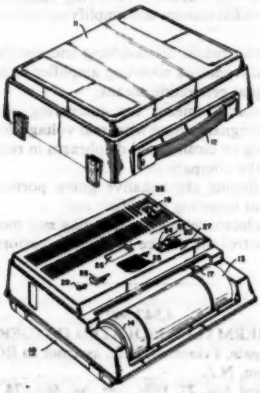
PORTABLE FACSIMILE TRANSMITTER

David G. Rutherford, Marlboro; Bernd Helling, Old Bridge, both of N.J., and John H. Long, Georgetown, Tex., assignors to The Associated Press, East Brunswick, N.J.

Filed Apr. 9, 1982, Ser. No. 367,049

Int. Cl.[4] H04N *1/08, 1/17, 1/40*

U.S. Cl. 358—256 **56 Claims**



1. A facsimile transmitter for sending a signal comprising video information to a remote receiver via a transmission means, for reproduction on a record medium, said transmitter comprising:

a rotatable cylindrical drum;

drum drive means for rotating said drum at a predetermined speed;

means for affixing a sheet to the cylindrical surface of said drum, said sheet having optically readable information to be transmitted disposed thereon, said means for affixing a sheet comprising:

a fixed clamp extending longitudinally of said drum,

a first clamp position indicating member secured in a predetermined position on said drum with respect to said fixed clamp, and

a movable clamp extending longitudinally of said drum, mounted for rotation about the longitudinal axis of said drum, and including a second clamp position indicating member;

stationary sensing means coupled to each of said clamp position indicating members for generating (i) a fixed clamp position signal each time said first clamp position indicating member traverses a first given point and (ii) a movable clamp position indicating signal each time said second clamp position indicating member traverses a second given point;

an optical carriage disposed adjacent said drum for movement along a line parallel to the longitudinal axis thereof, said optical carriage including optical means for scanning the surface of said drum and said sheet affixed thereto;

carriage drive means for causing said optical carriage to translate along said line at a desired linear speed;

a photodetector coupled to said optical means for converting the information on said sheet to a video signal, the video signal output range of said photodetector being determined by the amplitude of a video range bias signal applied thereto;

video level setting means coupled to said carriage drive means and said photodetector for (i) causing said carriage drive means to initially scan along said line from a position adjacent one end of said drum to a position adjacent the other end thereof, (ii) determining the peak value of said video signal during said initial scan, and (iii) setting the amplitude of said video range bias signal in response to said peak value of said video signal, so that the peak value of said video signal is maintained within a predetermined range;

scan control means operative after termination of the operation of said video level setting means for causing said carriage drive means to scan along said line; and

means for coupling said video signal to said transmission means.

4,547,811

METHOD AND APPARATUS FOR GRAY LEVEL SIGNAL PROCESSING

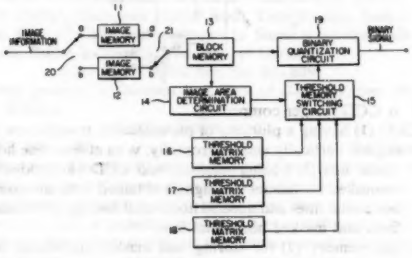
Hiroshi Ochi, and Nobuji Tetsutani, both of Kanagawa, Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Jun. 25, 1982, Ser. No. 392,155

Claims priority, application Japan, Jun. 29, 1981, 56-102057; Sep. 11, 1981, 56-143418; Mar. 6, 1982, 57-35557; May 26, 1982, 57-87963

Int. Cl.[4] H04N *1/40*

U.S. Cl. 358—280 **11 Claims**



1. A method of image area determination comprising the steps of:

dividing a pictorial image into blocks, each block being composed of a plurality of picture elements;

detecting the maximum optical density level (P_{max}) and the minimum optical density level (P_{min}) among optical density levels of picture elements for each block;

providing the difference value (P_{Δ}) between said maximum

optical density level (P_{max}) and said minimum optical density level (P_{min});

comparing said difference value (P_Δ) with a reference value;

detecting the state in which optical density levels of all picture elements in a block are at white level or at black level; and

determining said block to be a character image area when said difference value (P_Δ) is larger than said reference value or when said optical density levels of all picture elements in said block are at white level or at black level, otherwise determining said block to be a continuous-tone image area.

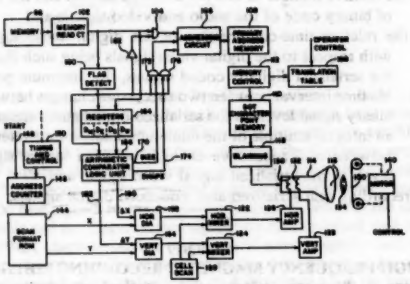
4,547,812
METHOD AND APPARATUS FOR FORMING HIGH RESOLUTION HALFTONE IMAGES

Robert W. Waller, Northridge, and Dean W. Anschultz, Canoga Park, both of Calif., assignors to Information International, Inc., Culver City, Calif.

Continuation-in-part of Ser. No. 151,660, Jun. 20, 1980, abandoned, which is a continuation of Ser. No. 924,640, Jul. 14, 1978, abandoned. This application Dec. 22, 1981, Ser. No. 333,385

Int. Cl.⁴ H04N *1/40*

U.S. Cl. 358—283 **22 Claims**



1. A photocomposing system for producing a half-tone replica of an original image comprising in combination:

means for scanning said original image to produce a digital representation of the tonal density of each of a plurality of points of said image;

comparison means for comparing digital representations of adjacent points within an area forming a cell for generating a "flag" signal when the differences in tonal density between said points exceeds a certain threshold;

arithmetic means responsive to the digital representations of points within a cell for producing a single digital weighted value for that cell;

dot character storage means storing a plurality of different halftone dot characters;

means responsive to each digital weighted value for selecting one of said halftone dot characters from said dot character storage means;

output means responsive to each halftone dot character selected for producing a visible representation of that dot character positioned at substantially the center of a cell area; and

means responsive to the generation of a "flag" signal associated with a cell for altering the horizontal and vertical positions of the visible representation produced in the area of that cell.

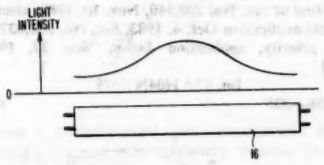
4,547,813
APPARATUS FOR CONTROLLING LIGHT DISTRIBUTION IN LINE SCAN OPTICAL IMAGING SYSTEMS

Cobern E. McGraw, Danbury, Conn.; Robert Gazzero, Poway, Calif., and David E. Christian, Danbury, Conn., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jan. 27, 1984, Ser. No. 574,456

Int. Cl.⁴ H04N *1/04, 1/10*

U.S. Cl. 358—285 **24 Claims**



1. A line scan optical imaging system including means for illuminating a line of a printed document and means for converting light reflected from the line of print to electrical signals, wherein the improvement comprises:

mask means, positioned between said illuminating means and said document, for controlling light transmitted from said illuminating means to said printed document line about a longitudinal axis thereof, said mask means having a pattern of opaque markings varying longitudinally with respect to the longitudinal axis, said pattern defined by an overlay of a plurality of irregularly spaced lines perpendicular to the longitudinal axis.

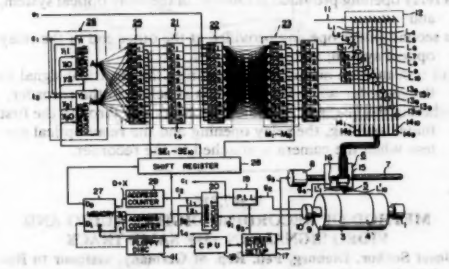
4,547,814
METHOD OF RECORDING A HALFTONE PICTURE ELECTRONICALLY

Makoto Hirosawa, Kyoto, Japan, assignor to Dainippon Screen Seizo Kabushiki Kaisha, Kyoto, Japan

Filed Dec. 6, 1982, Ser. No. 438,026

Int. Cl.⁴ H04N *1/22*

U.S. Cl. 358—298 **2 Claims**



1. A method for recording a halftone picture electronically, for use in a halftone picture reproducing machine for plate making, wherein a plurality of halftone data corresponding to a plurality of picture elements of a vignette halftone dot is simultaneously read out of a memory in which the vignette halftone dot quantized is stored, in synchronization with picture signals, and wherein the halftone data and the picture signals are added to obtain recording signals, and according to the recording signals a plurality of light beams for exposure are controlled to record a halftone picture, the improvement which comprises the steps of:

(a) selecting the number of the light beams included in a

recording scanning width depending on a screen pitch; and

(b) controlling the selected light beams according to the recording signals.

4,547,815

DETACHABLY CONNECTIBLE VIDEO CAMERA VIDEO RECORDER

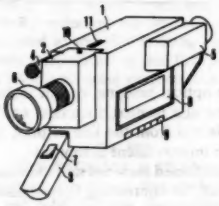
Takashi Kimura, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 208,340, Nov. 19, 1980, abandoned. This application Oct. 4, 1983, Ser. No. 538,837

Claims priority, application Japan, Nov. 27, 1979, 54-163978[U]

Int. Cl.⁴ H04N *5/78*

U.S. Cl. 358—335 **6 Claims**



1. A portable video recording system, comprising:

(a) a video camera including a camera housing,

image pick-up means for transducing an object image into an electrical signal,

a first finder opening for observing the object image,

a first optical system for introducing the object image to the pick-up means, and

a second optical system for introducing the object image to the first finder opening;

(b) a video recorder including,

a recorder housing having a mounting part to mount said camera housing to said recorder housing thereon in a freely attachable and detachable manner,

a relay optical system,

a relay opening provided at one end of the relay optical system, and

a second finder opening provided at the other end of the relay optical system; and

(c) transmission means for transmitting the electrical signal to the recorder when the camera is attached to the recorder,

wherein the image of the object is observable through the first finder opening, the relay opening and the relay optical system when the camera is attached to the recorder.

4,547,816

METHOD OF RECORDING DIGITAL AUDIO AND VIDEO SIGNALS IN THE SAME TRACK

Josef Sochor, Dieburg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 3, 1982, Ser. No. 374,196

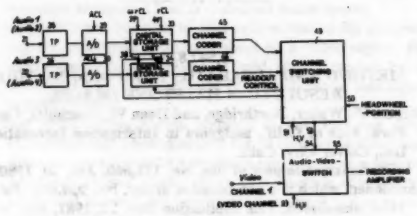
Int. Cl.⁴ H04N *5/782*

U.S. Cl. 360—19.1 **5 Claims**

1. Method of recording digitally coded television signals, including audio signals and video signals, on magnetic tape, in which at least the audio signals are time-compressed before recording, and which the audio and video signals are recorded in alternation on the same track, further comprising method steps of:

digitally encoding the audio signals and also the video signals of composite television signals to produce digital audio and video signals, each digital signal comprising a predetermined number of binary bits distinguished at any moment by one of two binary signal levels, each bit being assigned in the case of serial transmission, a bit cell which is a unit interval of which a plurality thereof constitute the serial transmission interval of a digital signal representing a sample of an audio or a video signal;

processing said digital audio and video signals, after encoding and before recording, with time-compression of the digital audio signals relative to the digital video signals, followed by serializing the digital signals and sequencing successions of digital video signals and successions of digital audio signals, said relative time-compression being such that the minimum frequency cycle period of the serialized digitally coded audio signals is greater than the



minimum frequency cycle period of the serialized digitally coded video signals,

the relative number of bits per encoded sample and the type of binary code of the audio and video signals and

the relative time-compression of the digital audio signals with respect to the digital video signals being such that in the serialized digitally coded signals, the minimum possible time interval between two successive changes between binary signal levels in the serialized digital audio signal, is an integral multiple of the minimum possible time interval between two successive changes between binary signal levels in the serialized digital video signal, and

recording said serialized and sequenced digital signals.

4,547,817

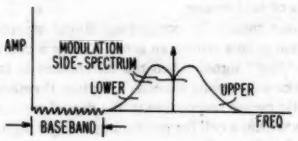
HIGH FREQUENCY MAGNETIC RECORDING METHOD

Klaas B. Klaassen, 'sGravenzande, Netherlands, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 373,203, Apr. 29, 1982, abandoned. This application Jan. 15, 1985, Ser. No. 691,690

Int. Cl.⁴ G11B *5/09, 5/04, 21/10*

U.S. Cl. 360—29 **10 Claims**



1. A method for magnetically recording a data signal on a magnetic medium with a magnetic head comprising the steps of:

providing a data signal to be recorded on a magnetic medium, said data signal having a frequency spectrum within a predetermined baseband;

generating a periodic carrier signal having a repetition frequency greater than the highest frequency of the baseband of the data signal;

modulating said carrier signal with said data signal to form a data modulated carrier signal having at least one sideband, wherein any sideband which is produced has a frequency

spectrum higher than the highest frequency of the said baseband;

demodulating said data modulated carrier signal in a recording channel which includes said magnetic head and said magnetic medium in a nonlinear mode so that the demodulated resultant signal has components in the baseband of the data signal whereby said resultant signal components are recorded on a magnetic medium; and

simultaneously reading out low frequency information with said baseband that has been prerecorded on said magnetic medium.

4,547,818

CIRCUIT ARRANGEMENT FOR THE RECORDING OF DATA ON A MAGNETIC RECORDING CARRIER

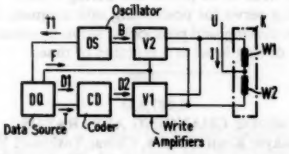
Herman Lia, Li, Norway, assignor to Tandberg Data A/S, Oslo, Norway

Filed Sep. 7, 1983, Ser. No. 530,030

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1982, 3233489

Int. Cl.⁴ G11B 5/09

U.S. Cl. 360—46 **9 Claims**



1. A circuit arrangement for the recording of data on a magnetic recording carrier, including a magnetic head with a center tap, a first write amplifier and a second write amplifier connected to the magnetic head, wherein the first write amplifier supplies data signals representing the data to be recorded and the second write amplifier supplies high-frequency magnetic bias signals to the magnetic head, and wherein the data signals and the magnetic bias signals are synchronized with one another, characterized in that the first write amplifier and the second write amplifier each comprise two binary logic elements which alternately switch, in dependence upon the binary values of the data signals and magnetic bias signals, respectively, with resistances connected with the outputs of the binary logic elements, respective logic elements of the write amplifiers being interconnected in pairs via the resistances to define connection points between the connected resistances, said connection points being connected to the magnetic head and the center tap of head having means for connection to an operating voltage.

4,547,819

MAGNETIC PICKUP PREAMPLIFIER

Edmund M. Meitner, Cote St. Luc, and Howard Burman, Montreal, both of Canada, assignors to Amber Electro Design, Inc., Montreal, Canada

Filed May 4, 1983, Ser. No. 491,349

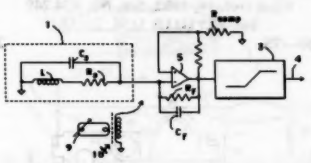
Int. Cl.⁴ G11B 5/45, 5/02

U.S. Cl. 360—65 **6 Claims**

1. A preamplifier for use with a magnetic pickup which includes an inductor comprising:

(a) first negative impedance means for connection to the pickup forming an integrator with the inductor, for establishing a pole at a frequency at the low end or below a frequency band to be translated by the preamplifier, and a transfer characteristic decreasing with increasing frequency at a predetermined rate, and

(b) a pedestal filter connected to receive an output signal of the first means having a zero phase shift point at a predetermined frequency higher than the frequency of the pole and within said frequency band, and an intermediate frequency band transfer characteristic increasing at a rate approximately equal to the decreasing transfer characteristic of the integrator, for providing an output signal upon a varying magnetic field being applied to the inductor,



whereby a predetermined gain characteristic is obtained having a low and high frequency response decreasing at said predetermined rate within increasing frequency, and an intermediate frequency response which is approximately constant.

4,547,820

FLOPPY DISK DRIVE APPARATUS

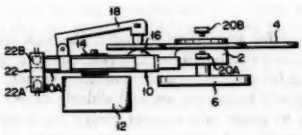
Shunji Saito, Numazu, Japan, assignor to Tokyo Electric Co., Ltd., Tokyo, Japan

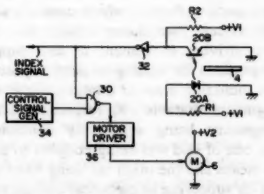
Filed Dec. 27, 1983, Ser. No. 565,919

Claims priority, application Japan, Jan. 7, 1983, 58-818; Jan. 7, 1983, 58-819

Int. Cl.⁴ G11B 19/00

U.S. Cl. 360—71 **12 Claims**





1. A floppy disk drive apparatus comprising:

index hole sensing means for detecting an index hole of a flopy disk and generating an index signal;

a disk holding member for holding the floppy disk;

drive means for rotating the disk holding member; and

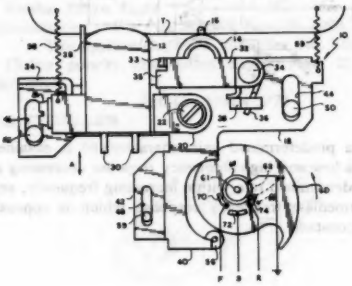
control means for supplying a drive signal to the drive means in response to an output signal from the index hole sensing means whose signal level is different from that of the index signal.

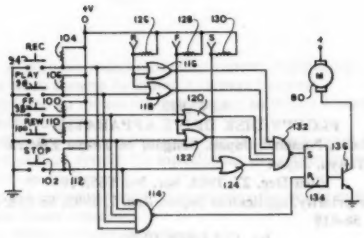
4,547,821

HEAD SUPPORT AND POSITIONING ASSEMBLY FOR RECORD/PLAYBACK DEVICE

Richard G. Rutkowski, Milford; John J. Dwyer, Stratford, and John W. Hoover, Huntington, all of Conn., assignors to Dictaphone Corporation, Rye, N.Y.

Filed Oct. 14, 1982, Ser. No. 434,249
Int. Cl.[4] G11B 5/54, 21/12
U.S. Cl. 360—75 22 Claims





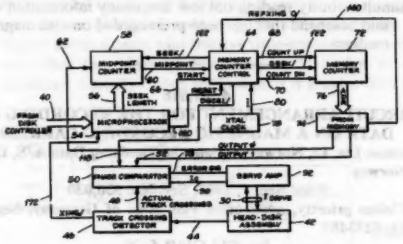
1. Apparatus for supporting a record/playback transducer for use in a record and/or playback device, comprising slidable support means for supporting said transducer; mounting means for mounting said transducer on said slidable support means; guide means to guide said support means for bi-directional sliding movement; and drive means for driving said support means, said drive means including a selectively energizable motor for providing motive power, cam means coupled to and rotated by said motor and having a cam surface; said support means having a portion thereof which contacts said cam surface such that as said cam means rotates the cam surface thereof imparts driving movement to said support means, position sensing means for sensing respective positions of said support means including a set of contact means and a set of conductive segments rotatable with respect to each other, said conductive segments being selectively contacted by said contact means, one of said sets being coupled to and rotatable with said cam means and the other set being fixed with respect thereto; means for supplying an electrical voltage to one of said sets; and means for providing position signals as a function of the particular segments which are contacted by said contact means, thereby indicating the angular position of said cam means and the slidable position of said support means and motor control means for energizing said motor to change the position of said support means, said motor control means being responsive to said position signals representing a predetermined one of first, second and intermediate positions to de-energize said motor.

4,547,822

HEAD POSITIONING SERVO FOR DISK DRIVES

Stewart C. Brown, Newport Beach, Calif., assignor to Tecstor, Inc., Huntington Beach, Calif.

Filed Aug. 4, 1983, Ser. No. 520,149
Int. Cl.[4] G11B 5/55
U.S. Cl. 360—78 18 Claims



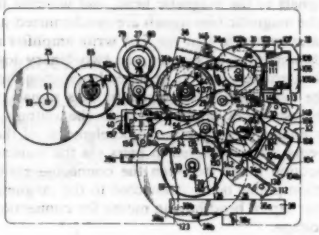
1. A positioning apparatus for a magnetic head comprising:
a magnetic head to be positioned during a seek;
a positioning servo for positioning said magnetic head; and
a driver for driving said positioning servo by controlling the position of said head as a function of time.

4,547,823

MODE CHANGING APPARATUS

Masao Ri, Tokyo; Kenji Ohhara, Chiba; Yoshinori Yamamoto, Yokohama; Akira Takada, Abiko; Hisanori Watanabe, Kanagawa, and Yasuo Osada, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 30, 1983, Ser. No. 480,513
Claims priority, application Japan, Mar. 31, 1982, 57-52895
Int. Cl.[4] G11B 5/44
U.S. Cl. 360—90 13 Claims



1. A mode changing apparatus for a tape recording/reproducing apparatus, of the type including a mode changing mechanism having a rotatable changing gear with a toothless gap on the toothed periphery thereof, a magnet mounted on said changing gear for rotation therewith and electromagnetic yoke means for cooperating with said magnet to cause initial angular displacement of the changing gear from a staging position, in which the toothless gap faces a drive gear, to an actuating position, in which the toothed periphery engages the drive gear to turn said changing gear, when said yoke means is energized, the mode changing apparatus comprising:
a pair of mode changing members engageable with cam means mounted to said changing gear for rotation therewith and movable, in response to rotation of said changing gear, from inactive positions to active positions against the force of spring means;
holding means movable toward a holding position in response to movement of said mode changing members toward said active positions, wherein said holding means

in said holding position holds said mode changing members in said active positions against the force of said spring means; and

armature means mounted to said holding means for movement into contact with said yoke means in response to movement of said holding means toward said holding position to magnetically hold said holding means in said holding position.

4,547,824

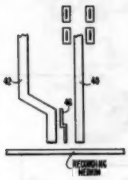
DUAL BIASING FOR INTEGRATED INDUCTIVE MR HEAD

John S. Best, San Jose; Kenneth Lee, Saratoga, and Ching H. Tsang, Sunnyvale, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1982, Ser. No. 450,622

Int. Cl.⁴ G11B *5/12, 5/30*

U.S. Cl. 360—113 **7 Claims**



1. A dual element magnetic transducer comprising an inductive write element and an integral MR read element,

said write element comprising a magnetic core including first and second pole tips defining an air gap adapted to be disposed in flux transmitting relationship with the surface of a magnetic storage medium, a coil disposed on said core adapted to be energized by a write current when said transducer is writing data to said storage medium and a bias current when said transducer is reading data from said storage medium.

said MR element being disposed in said air gap with one planar portion having a first spatial relationship relative to said pole tips and another planar portion thereof having a second spatial relationship with said pole tips wherein at least one of said planar portions is subtantially parallel to at least one of said pole tips whereby said first and second spatial relationships cause a portion of the flux in said gap generated by said bias current to flow from one of said pole tips through said planar portions of said MR element in a direction normal to the surface of said medium to said other pole tip to establish a transverse bias field for said MR element during said read operation.

4,547,825

ARRANGEMENT FOR A STARTING AND PROTECTING APPARATUS STRUCTURAL UNIT FOR AN ELECTRIC MOTOR-COMPRESSOR UNIT

Holger V. Vind, Sønderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

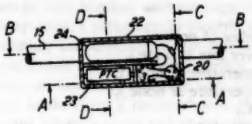
Filed Feb. 16, 1984, Ser. No. 580,824

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1983, 3307913

Int. Cl.⁴ H02H *7/085*

U.S. Cl. 361—22 **4 Claims**

1. A starting and protecting unit for a hermatically encapsulated electric motor and compressor assembly having a capsule casing with an output pressure tube extending from said casing, said unit comprising a series arrangement of a temperature responsive protective switch for interupting motor current and a motor starting coil PTC resistor, means for thermally connecting said PTC resistor and said protective switch to said pressure tube, said protective switch and said PTC resistor having a common housing, clamping means for clamping said housing to said pressure tube, said housing having a bore and slot construction adapted to the external diameter of said pressure tube to facilitate connecting said housing to said pressure tube.



4,547,826

GENERALIZED REAL-TIME THERMAL MODEL

William J. Premerlani, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 30, 1983, Ser. No. 556,743

Int. Cl.⁴ H02H *7/08*

U.S. Cl. 361—25 **14 Claims**

1. A method for protecting an induction motor from excesive thermal overloads with the aid of a general purpose microprocessor, comprising:

defining an electrical thermal analog of the motor, wherein the thermal analog includes copper thermal mass (C1) of the motor, iron thermal mass (C2) of the motor, a first thermal resistance (R1) coupled between the copper (C1) and iron (C2) thermal mass, wherein node 1 is a circuit point between copper thermal mass (C1) and first thermal resistance (R1) and node 2 is a circuit point between iron thermal mass (C2) and first thermal resistance (R1), a first voltage source (E1) indicative of ambient temperature of the motor, a second thermal resistance (R2) coupled between the iron thermal mass (C2) and the first voltage source (E1), wherein node 3 is a circuit point between second thermal resistance (R2) and first voltage source (E1), a third thermal resistance (R3) and switching means for opening and closing an electrical circuit, said switching means having an input and an output, wherein said third thermal resistance (R3) is coupled between the iron thermal mass (C2) and the input of said switching means and the output of said switching means is coupled to said first voltage source, a second voltage source (E2) indicative of the temperature of the windings of the motor and a fourth thermal resistance (R4) coupled between the copper thermal mass (C1) and the second voltage source (E2), and further wherein node 4 is a circuit point between fourth thermal resistance (R4) and a second voltage source (E2), and wherein each of first (E1) and second (E2) voltage sources, copper thermal mass (C1) and iron thermal mass (C2) is referenced to the same electrical potential;

providing the microprocessor with a data base for said motor including at least:

power losses (P_i) within the motor for each node i of the thermal analog, and

thermal time constants for the combination of each thermal mass and thermal resistance coupled directly thereto;

constantly determining ambient temperature (E1) of the motor operating environment;

constantly providing the microprocessor with said environment temperature (E1);

constantly determining temperature (E2) of the windings of the motor;

constantly providing the microprocessor with said windings temperature (E2);

repetitively calculating in the microprocessor, at predetermined intervals Δt, the following equation over all nodes i:

$$\Delta T_i = \alpha_i \cdot P_i - \sum_{j=1}^{N} \beta_{ij} \cdot (T_i - T_j),$$

wherein:

N=number of nodes i,

P_i=power loss at node i,

T_i=temperature at node i,

T_j=temperature at node j,

$\alpha_i = \Delta t / C_i$

$\beta_{ij} = \Delta t / (R_{ij} C_i)$

ΔT_i=temperature change at node i over interval Δt;

adding each calculated value of temperature change ΔT_i to a previous value of node i temperature T_{iold} to create T_{inew}, wherein T_{inew} is used as the value of T_{iold} for the next interval Δt;

repetitively comparing in the microprocessor at said predetermined intervals the temperature T_{inew} at node i with a predetermined temperature limit T_{iM} for node i; and

removing power supplied to said motor when temperature T_{inew} equals or exceeds the predetermined temperature limit T_{iM} for node i.

4,547,827

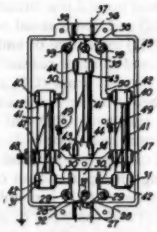
POWER SURGE ISOLATOR

Harold E. Shedd, Rt. 1, Box 242, Suni-Pines Park, Nicholson, Ga. 30565

Continuation-in-part of Ser. No. 467,947, Feb. 18, 1983, Pat. No. 4,500,862. This application Jul. 5, 1983, Ser. No. 510,668

Int. Cl.⁴ H02H *3/20*

U.S. Cl. 361—55 **1 Claim**



1. A power surge isolator for the protection of electrical appliance circuits comprising an insulating housing having opposite end inlet openings for a three conductor power cable and a three conductor appliance cable, a pair of power supply terminal strips within said housing and being electrically connected at corresponding ends with two conductors of the power cable of opposite polarities and carrying conducting clips at their other corresponding ends, terminal elements within the housing near its end adjacent to the appliance cable and being electrically connected with two conductors of the appliance cable of opposite polarities and being equipped with conductor clips spaced coaxially from the conductor clips of the power supply terminal strips, a pair of fuses having opposite end electrical terminals engaged releasably within the conductor clips of the power supply terminal strips and said terminal elements, a central longitudinal grounding strip within the housing extending substantially between the opposite end inlet openings and being electrically connected to ground conductors of the power cable and appliance cable, a pair of conductor clips on said grounding strip in longitudinally spaced relationship, one of said last-named clips being spaced substantially from the inlet opening for the appliance cable and said terminal elements, a single fuse within said housing having opposite end electrical terminals which are held by the terminal clips of said grounding strip, a grounding power stop strip attached to and extending transversely of the longitudinally extending grounding strip and extending beyond opposite sides of said grounding strip and having opposite end conductor clips embracing insulating envelopes of said pair of fuses near and in spaced relationship to the conductor clips of said terminal elements, a pair of varistors electrically connected between said pair of power supply terminal strips and said transverse power stop strip, and an additional ground terminal extending exteriorly of the insulating housing and being electrically connected with the grounding power stop strip through one of its end conductor clips.

4,547,828

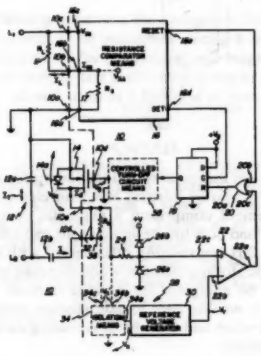
CIRCUIT FOR PREVENTING EXCESSIVE POWER DISSIPATION IN POWER SWITCHING SEMICONDUCTORS

Milton D. Bloomer, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 31, 1983, Ser. No. 499,590

Int. Cl.⁴ H02H *3/20*

U.S. Cl. 361—86 **13 Claims**



1. Apparatus for preventing excessive power dissipation in a power switching semiconductor device having a controlled-conduction circuit connected to a load and a control electrode receiving a drive signal supporting a flow of saturation current through said controlled conduction circuit up to a maximum value determined by the magnitude of the drive signal, comprising:

means for applying an AC voltage across said connected controlled-conduction circuit and load;

means for providing a saturation reference voltage;

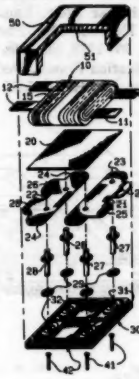
comparison means for providing a protect signal if the magnitude of that portion of the AC voltage across the controlled-conduction circuit of the semiconductor device instantaneously exceeds the saturation reference voltage and including: a comparator having a first input receiving the voltage across the controlled-conduction circuit of said device, a second input receiving said saturation reference voltage, and an output providing said protect signal only if the magnitude of the voltage at said first input exceeds the magnitude of the voltage at said second input; and

means for completely removing the control electrode drive signal from said device for the remainder of each AC voltage cycle during which said protect signal is provided by said comparison means, and including: a flip-flop element having a set input, a reset input receiving said comparison means protect signal, and an output at which said control electrode signal appears responsive to said set input being enabled by a signal external to said apparatus, but only if said comparison means protect signal is not present at said rest input.

4,547,829
CAPACITOR ASSEMBLY

Thomas W. Efford, Knoxville, and Joseph A. Moresi, Jr., Oak Ridge, both of Tenn., assignors to Sprague Electric Company, North Adams, Mass.

Filed May 30, 1984, Ser. No. 615,489
Int. Cl.[4] H01G 1/14, 9/00
U.S. Cl. 361—306 8 Claims

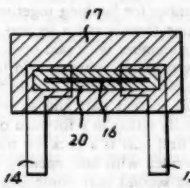


1. A capacitor assembly comprising a wound and flattened, non-extended foil capacitor section having at least one electrode tab connected to one electrode extending from one side of said section and another tab connected to another electrode extending from an opposite side of said section, a capacitor case having an insulating cover and an insulating base, a pair of conductive members each having at least one hole therein, conductive means passing through said hole and said base securing said members to said base, said conductive members each having end portions and side portions, said end portions being folded over and connected to an end of said conductive means, each side portion being connected to one of said electrode tabs, said cover enclosing said section and being sealed to said base.

4,547,830
DEVICE FOR PROTECTION OF A SEMICONDUCTOR DEVICE

Yoshio Yamauchi, Kyoto, Japan, assignor to Rohm Company Limited, Kyoto, Japan

Continuation of Ser. No. 183,365, Sep. 2, 1980, abandoned. This application Sep. 30, 1983, Ser. No. 537,161
Claims priority, application Japan, Sep. 11, 1979, 54-125247[U]; Sep. 11, 1979, 54-125248[U]; Dec. 17, 1979, 54-174468[U]; Jan. 21, 1980, 55-5626[U]
Int. Cl.[4] H02H 7/20
U.S. Cl. 361—104 3 Claims

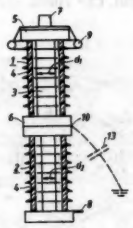


1. A protective element for use in a device for protecting a semiconductor device from overcurrent, comprising a package made of a molded synthetic resin, a pair of conductive leads having their inner ends in said package and mounted in spaced apart relation and having their outer ends extending out of said package and being adapted for connection in circuit to a semiconductor device, and a metallic fuse wire connected between said inner ends of said leads wherein each such fuse wire to lead connection is wire bonded, said package of molded synthetic resin comprising a permanently flexible synthetic resin portion surrounding and contacting the surface of said fuse wire and a nonflexible synthetic resin portion encapsulating said flexible resin portion with said fuse wire therewithin, said fuse wire being made from a metal chosen from the group consisting of gold, silver, copper and aluminum, which group is characterized by relatively low specific resistances and relatively high melting points, and said fuse wire having a cross section and length selected such that when a current through said semiconductor device and said fuse wire approaches, but does not reach a predetermined current level known to destroy said semiconductor device, said wire is melted, whereby the melting of said fuse wire occurs more promptly than if made of a metal having a relatively higher specific resistance and relatively lower melting point compared to metals in said group, and said permanently flexible synthetic resin portion supportively protects said fuse wire, prior to melting, from damage due to external mechanical forces and yet flexibly yields to said melting of said fuse wire so as to allow formation of gap widening rounded ends of the melted fuse wire.

4,547,831
SURGE ARRESTER

Per-Åke Hellman, Idkerberget, and Lennart Stenström, Ludvika, both of Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Feb. 28, 1983, Ser. No. 470,779
Claims priority, application Sweden, Mar. 4, 1982, 8201342
Int. Cl.[4] H02H 9/04
U.S. Cl. 361—127 5 Claims



1. A surge arrester comprising a top terminal, a bottom terminal and at least one surge arrester unit connected between said top and bottom terminals, said surge arrester unit comprising an elongated electrically insulating housing and a plurality of electrically series-connected metal oxide varistor blocks arranged in a stack or in a plurality of electrically series-connected stacks in the electrically insulating housing, the varistor blocks at the top terminal of the arrester having a greater diameter than the varistor blocks at the bottom terminal of the arrester.

4,547,832
METALLIZED FILM WOUND CAPACITOR HAVING MINIMIZED INDUCTIVE REACTANCE AND METHOD THEREFOR

Bernard Lavene, Ocean, N.J., assignor to Electronic Concepts, Inc., Eatontown, N.J.

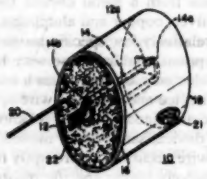
Filed Mar. 5, 1984, Ser. No. 586,013
Int. Cl.[4] H01G 1/14, 7/00
U.S. Cl. 361—307 13 Claims

1. A flattened wound capacitor for use in high frequency

applications having a large value of capacitance and large current carrying capability comprising:

a metallized film wound around a flattened non-conductive oval core electrically connected to a first terminal coupled to the first end of the film, said film having a first inductive reactance and producing a first electromagnetic field;

a conductor at least disposed within the entire length of the oval core electrically connected to a second terminal



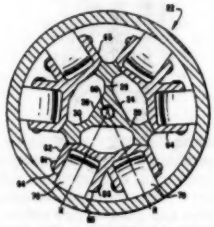
coupled to the second end of the film, said conductor of sufficient width and thickness to produce a second inductive reactance with a related second electromagnetic field in the direction opposite the first magnetic field whereby the second magnetic field substantially cancels the first magnetic field thereby subtracting the second inductive reactance from the first inductive reactance for maximizing the self resonant frequency.

4,547,833

HIGH DENSITY ELECTRONICS PACKAGING SYSTEM FOR HOSTILE ENVIRONMENT

Stanley O. Sharp, Missouri City, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 23, 1983, Ser. No. 565,067
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—386 **2 Claims**



1. A high density electronics packaging system adapted for use in a hostile environment, such as usable for packaging the electronics circuitry of a measurements-while-drilling well tool, comprising:

a protective housing;

an elongated, rigid chassis of unitary construction having a central core and a symmetrical arrangement of at least three arms extending at equall angles radially therefrom along the length thereof;

a plurality of longitudinally extending electronics modules respectively mounted lengthwise of the chassis between different adjacent pairs of the arms;

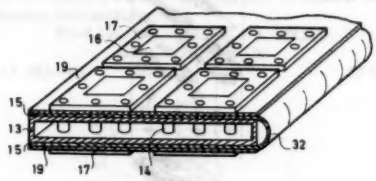
a plurality of support assemblies axially-spaced along the chassis and serving to mount the chassis in isolation within the interior of the protective housing, the support assemblies comprising means to maintain the chassis and electronics modules away from the walls of the housing and means to protect the electronic modules from adverse effects due to external forces applied to the housing; and means positioned above and below the electronics modules to convey heat away from the electronics modules.

4,547,834

STRUCTURE FOR ASSEMBLING COMPLEX ELECTRONIC CIRCUITS

Bernard Dumont; Christian Proponet, both of Paris; Bernard Bancelin, Chatou; Roland Brucker, Clamart; Jean-Louis Bories, Paris, and Christiane Klein, Lagny sur Marne, all of France, assignors to Thomson-CSF, Paris, France

Filed Dec. 29, 1983, Ser. No. 566,735
Claims priority, application France, Dec. 30, 1982, 82 22075
Int. Cl.[4] H05K *7/20*
U.S. Cl. 361—386 **6 Claims**



1. A structure including:

at least one electronic circuit having connection tabs;

a cooling member constituting a support member for said at least one electronic circuit and having two main plane faces, said cooling member being capable of passing a flow of cooling fluid;

at least one interconnetion circuit placed in contact with at least one of said main plane faces of said cooling member;

conductive elastomer compressing means on said interconnection circuit and electrically connecting said electronic circuit to said interconnection circuit in a solder-free manner; and

at least one metal frame mechanically fixing said electronic circuit to said cooling member, said metal frame compressing said conductive elastomer between the interconnection circuit and the connection tabs of said electronic circuit.

4,547,835

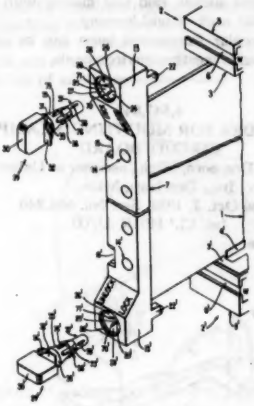
MECHANICAL LOCKING DEVICE FOR ELECTRICAL EQUIPMENT

Marcel F. R. Pansaerts, Antwerp; Joseph M. F. Bogaert, Wilrijk, and Etienne K. A. Decolvenaer, St. Katelijne-Waver, all of Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 21, 1983, Ser. No. 477,574
Int. Cl.[4] H05K *1/18*
U.S. Cl. 361—399 **6 Claims**

1. A mechanical locking device including a rotatable stem-shaped locking member for latching together a first part having a locking opening therein and a second part, by cooperation of said locking member with said opening during a rotation of said locking member, wherein said locking member is shaped so as to be able to be pushed axially through a resilient locking hole in said second part and so as to be thereafter unable to move axially either in a forward or rearward direction, wherein said first part is a rack for mounting electrical equipment and provided with said opening and with guiding means and that said second part comprises a printed circuit board with parallel edges slidably mounted in said guiding means and a supporting element and is provided with said locking hole, said supporting element carrying said locking member, and wherein said resilient hole in said supporting element is delimited by an annular recess prolonged by a resilient split frusto-conical sleeve comprising a plurality of resil-

ient lips and that said locking member has a first collar fitting in said annular recess and a frusto-conical second collar, said split sleeve and said second collar being so shaped that when



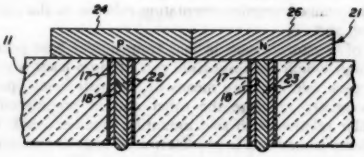
said locking member is inserted into said hole until said first collar is engaged in said annular recess, said second collar spreads out said resilient lips of said split sleeve until these lips snap behind said second collar.

4,547,836

INSULATING GLASS BODY WITH ELECTRICAL FEEDTHROUGHS AND METHOD OF PREPARATION

Thomas R. Anthony, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 1, 1984, Ser. No. 576,085
Int. Cl.⁴ H05K *1/18*
U.S. Cl. 361—400 **9 Claims**



1. A body of electrically insulating glass having opposed, spaced major surfaces and at least one bore extending completely therethrough interconnecting said major surface, said bore having a diameter of less than about 10 mils and an average length-to-diameter ratio of from about 6:1 to about 50:1 and having a metal lining, said metal lining being directly bonded to an underlying layer of metal directly bonded to said insulating glass, the metal of said metal lining being selected from the group consisting of copper, silver, gold, nickel, platinum and tin and providing a continuous electrical path between said major surfaces.

5. The body of electrically insulating glass of claim 1 wherein at least one semiconductor chip is bonded to a major surface of said body, said chip being electrically connected to solder pins, each such solder pin filling a copper-lined bore and providing electrical conductivity through said body.

4,547,837

TRACER LITE

Tommy N. Bennett, 2605 W. 19th, Plainview, Tex. 79072

Filed Oct. 3, 1983, Ser. No. 538,485
Int. Cl.⁴ F21L *7/00*
U.S. Cl. 362—186 **5 Claims**

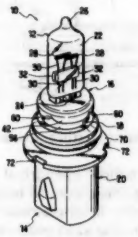
1. A light producing attachment applicable to the nock end of a tubular archer arrow manufactured to commercial tolerances whereby said attachment may be substituted into the bore of said arrow in lieu of the commercial nock comprising in combination a cylinder in threaded communication with a commercial archer's nock said cylinder closed at one end and internally threaded at the other end and having a spring and battery therein, said archer's nock encasing a light emitting diode and being retained on an externally threaded nonconductive plastic support said threaded support having an opening therethrough for receiving an electrical lead.

4,547,838

ELECTRIC LAMP ASSEMBLY WITH A MOLDED PLASTIC BASE

Yukio Wakimizu, Shizuoka, Japan, assignor to Koito Seisakusho Co., Ltd., Tokyo, Japan

Filed Sep. 4, 1984, Ser. No. 646,925
Claims priority, application Japan, Sep. 5, 1983, 58-137665[U]
Int. Cl.⁴ F21M *3/30*
U.S. Cl. 362—211 **10 Claims**



1. An electric lamp assembly comprising:
(a) a lamp unit comprising:
(1) an envelope having a hermetic seal at one end and containing a filament and lead in wires having portions anchored in the hermetic seal of the envelope; and
(2) a plurality of relatively rigid main conductors anchored in the hermetic seal of the envelope and extending outwardly therefrom, the main conductors being electrically connected to the lead in wires in the hermetic seal of the envelope;
(b) a base subassembly comprising:

(1) a metal made lamp holder substantially in the shape of a disk apertured to allow the hermetic seal of the envelope of the lamp unit to pass therethrough, the lamp holder being further adapted to engage the hermetic seal of the envelope for firmly holding the lamp unit;

(2) a metal made coupling substantially in the shape of a tube loosely surrounding the main conductors of the lamp unit and having one end rigidly engaged with the lamp holder; and

(c) a substantially tubular base unit comprising:

(1) an integral moding of plastics material having one end adapted to receive another end of the coupling with a sliding fit, the main conductors of the lamp unit extending into the base unit; and

(2) connector means built into the base unit and electrically connected to the main conductors of the lamp unit, the connector means further serving to rigidly mechanically connect the main conductors to the base unit,

whereby assembly of the lamp assembly is effected by assembling the lamp unit, the lamp holder and the coupling together to form a first subassembly, and then mounting the first subassembly to the base unit with the coupling slidably received in one end of said base unit.

4,547,839

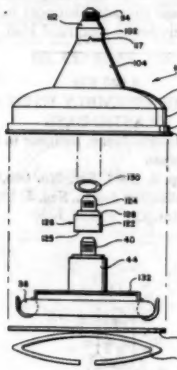
OUTDOOR LIGHTING FIXTURE

John F. Ripley, and Bernice D. Ripley, both of 2 Forecastle Dr., New Port Richey, Fla. 33552

Division of Ser. No. 516,478, Jul. 25, 1983, abandoned. This application Dec. 20, 1984, Ser. No. 665,620

Int. Cl.⁴ F21S *5/00*

U.S. Cl. 362—216 **5 Claims**



1. An outdoor lighting fixture for a circular fluorescent lamp, comprising:

a housing having a hollow cylindrical upper neck, a downwardly depending frusto-conical body and a downwardly depending, generally hemispherical shade portion which terminates in a circular skirt portion;

a first socket member having a cylindrical body portion adapted for mating with the upper portion of the inner surface of said neck of said housing, a threaded male electrical connector for threadably connecting to a powered light socket, and a lower flat surface having a threaded female electrical connector therein;

a second socket member having a cylindrical body portion adapted for mating with the lower portion of said inner surface of said neck of said housing, a threaded male electrical connector for threadably connecting to said female connector of said first socket member, an upper flat surface surrounding said male connector thereof, and a lower surface having a threaded female electrical connector therein, for threadably receiving a threaded male electrical connector of a circular fluorescent lamp;

an annular seal, compressively mounted between said lower flat surface of said first socket and said upper flat surface of said second socket, said seal mating with said inner surface of said neck of said housing;

whereby a circular fluorescent lamp can be operated in outdoor adverse weather environments.

4,547,840

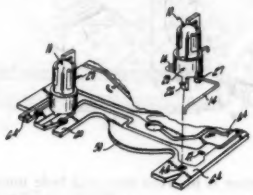
LAMP HOLDER FOR MOUNTING A LAMP ON A CIRCUIT BOARD

David V. Tinder, Dearborn, Mich., assignor to United Technologies Automotive, Inc., Dearborn, Mich.

Filed Oct. 2, 1984, Ser. No. 656,840

Int. Cl.⁴ H01R *33/00*

U.S. Cl. 362—226 **7 Claims**



1. An improved one-piece lamp holder for mounting a lamp on a circuit board, the lamp being generally tubular and having a filament connected to a pair of leads, said holder comprising:

an annular base portion adapted to be supported on a surface of a circuit board and sized to receive therein at least the base of a respective lamp;

a support spine extending upwardly from said base portion and including clamp means for resiliently engaging and retaining a respective lamp;

at least two angularly-spaced, mounting members depending from said base portion for insertion through respective mounting apertures in the circuit board and for locking engagement with the reverse surface of the board, the geometry of said mounting members and circuit board apertures cooperatively serving to key said holder to a predetermined angular orientation relative to the circuit board; and

a pair of aperture means in said lamp holder base portion through which the respective pair of lamp leads may be led, each said aperture means of said pair being spaced substantially opposite the other and in predetermined angular relation with said mounting members such that the lamp is mounted in predetermined angular relation to the board.

4,547,841

ADJUSTABLE LUMINAIRE

Honesto D. Quiogue, Blacksburg, Va., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Jan. 16, 1984, Ser. No. 570,963

Int. Cl.⁴ F21V *21/26*

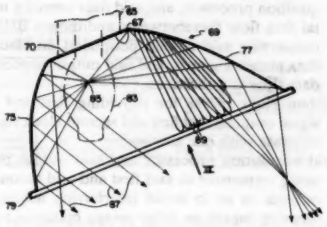
U.S. Cl. 362—269 **1 Claim**

1. An improved luminaire for use with high intensity discharge lamps, the luminaire being of the type having a housing, a mounting bracket coupled to said housing, lamp mounting means on said housing for receiving a lamp with the central axis of the lamp in a predetermined relationship to said mounting means and housing and an open-ended reflector attached to said housing, said housing being angularly adjustable relative to said mounting bracket to thereby adjust the inclination of the axis of said lamp, the improvement wherein

said reflector has a wall formed such that the interior reflec-

tive surface thereof defines first and second distinct surfaces of revolution which are different from each other, each surface occupying about one-half of the internal circumference of the reflector, the two surfaces being separated by transition regions extending from said means for attaching to said open end,

said first of said surfaces comprising a parabola having a central axis at an angle of about 54° relative to the longitudinal axis of said lamp; and



said second of said suraces following an elliptical surface of revolution having one focus at the center of said lamp, said second of said surfaces being fluted;

and wherein said reflector further comprises

means defining an opening in said reflector through which a lamp can extend from said lamp mounting means into said reflector; and

means around said opening for attaching said reflector to said lamp mounting means.

4,547,842

ELECTRICAL SHOCK PREVENTION MEANS FOR HIGH VOLTAGE DC REGULATORS

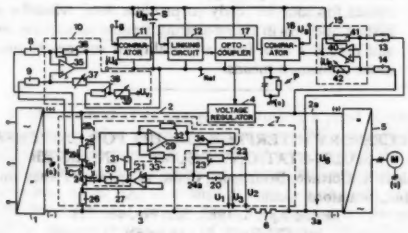
Hans M. Beierholm, Fynshav, and Niels Thun, Stenderup, both of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Oct. 20, 1983, Ser. No. 543,901

Claims priority, application Fed. Rep. of Germany, Nov. 16, 1982, 3242316

Int. Cl.⁴ H02M *5/42*

U.S. Cl. 363—35 **8 Claims**



1. Power supply apparatus for supplying an electric consumer with a high DC voltage from a DC voltage source with positive and negative output potentials relative to earth potential, comprising, evaluating circuit means having solid state components, a dedicated voltage source for said evaluating circuit means for supplying operating currents to said components, positive and negative supply lines having source terminals connectable to said DC voltage source and supply terminals connectable to said electric consumer, said supply lines having voltage control means, monitoring means for measuring currents and voltages at said supply terminals and generating at least one resulting signal, said evaluating circuit means having means for generating a reference signal and comparator means for comparing said reference signal and said at least one resulting signal and generaing a control signal, said evaluating circuit means having an optocoupler stage for directing said control signal to said supply lines voltage control means, operational amplifier means connected to said comparator means having an inverting input connected to said monitoring means and a noninverting input connected an earth potential reference, both of said inputs of said operational amplifier have high ohmic resistor means on the order of 7 to 11 megohms, feedback resistor means between the output of said operational amplifier and said inverting input thereof, reference resistor means between said noninverting input of said operational amplifier and a ground reference, said high ohmic resistor means along with said feedback resistor means and said reference resistor means forming a balanced bridge, said resulting signals include a current signal, said monitoring means includes a monitoring operational amplifier means having inverting and noninverting inputs and transistor means for generating said current signal, and said transistor means having a collector resistor from which said current signal is directed.

4,547,843

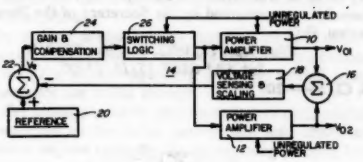
MULTIPLE OUTPUT DC POWER SUPPLY

David J. Hucker, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Continuation of Ser. No. 539,940, Oct. 7, 1983, abandoned. This application Nov. 13, 1984, Ser. No. 670,916

Int. Cl.⁴ H02M *7/55*

U.S. Cl. 363—67 **8 Claims**



1. In a DC power supply having first and second power amplifiers, each of which is responsive to an AC power source and a set of control signals to provide a regulated DC output, a simplified system for controlling said first and second power amplifiers to provide matched DC outputs comprising:

means for adding the regulated DC outputs from said first and second power amplifiers to provide a signal representing the sum thereof;

means for comparing said sum signal to a first reference signal to provide an error signal representing the difference between the sum and reference signals;

means responsive to said error signal for providing a set of control signals for each of said first and second power amplifiers.

4,547,844

SHELF HEIGHT SELECTOR

Walter P. Adams, Salt Lake City, Utah, assignor to The Raymond Corporation, Greene, N.Y.

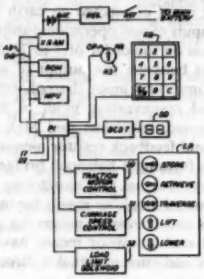
Continuation of Ser. No. 20,996, Mar. 16, 1979, abandoned. This application Feb. 17, 1982, Ser. No. 349,652

Int. Cl.⁴ G05R *13/00*

U.S. Cl. 364—189 **21 Claims**

21. A controller for an auxiliary mechanism of an industrial truck, comprising: a sensor which is coupled to detect movement of the said mechanism and provides signals denoting increments of that movement; a counter which receives said signals and thereby provides a count denoting the position of the mechanism along its range of movement; a memory which is controllable to provide one of a plurality of stored representations for comparison with said count; means for comparing the count with a representation made available from the mem-

ory to provide a signal for controlling the movement of the mechanism; means for effecting storage in the memory of signals denoting different positions along the range of movement; a keyboard means, operable by a human operator, for



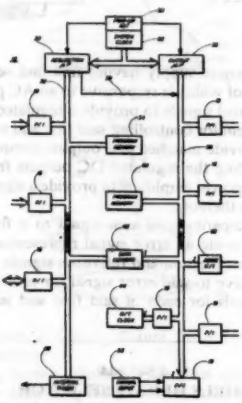
effecting storage of said count by said memory in a storage location of which the address is determined by the operation of a particular selection from said keys; and means responsive to operation of the keyboard to address the memory to make the stored count available for comparison.

4,547,845

SPLIT-BUS MULTIPROCESSOR SYSTEM

Jerry H. Ross, Gulfport, Miss., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 21, 1982, Ser. No. 370,310
Int. Cl.[4] G06F *15/16, 13/00*
U.S. Cl. 364—200 **3 Claims**



1. A split BUS, plural processor system for managing the flow of digital data from a plurality of peripheral sources to one or more utilization devices, said system comprising:

acquisition processor for controlling data acquisition functions of said system;

output processor for controlling data output functions of said system;

a plurality of sources of digital data each including an analog to digital converter; at least one digital data utilization means;

an acquisition program memory connected to said acquisition processor means and accessible thereby for providing acquisition program signals thereto;

an output progam memory connected to said output processor means and accessible thereby for providing output program signals thereto;

a plurality of first peripheral interface means each connected to one of said sources;

at least one second peripheral interface means connected to said digital data utilization means;

data memory means for temporarily storing and reading out digital data from said sources;

split BUS means comprising acquisition BUS means interconnecting said first peripheral interface means, said acquisition processor, and said data memory means for digital data flow therebetween, and output BUS means interconnecting said second peripheral interface means, said data memory means, and said output processor for digital data flow therebetween;

system clock means for providing first and second clock signal outputs, said first and second clock signals being out of phase with one another;

said acquisition processor and said output processor each being responsive to said first and said second clock signal outputs so as to avoid interferring access to said data memory means or other means common to both of said acquisition and output BUSes;

internal times means, connected to said acquisition BUS and is set by said acquisition processor to provide data sample rate signals to said analog to digital converter of a respective source for generation of digital data to be stored in said data memory means;

said acquisition processor being operative to successively poll said first peripheral interface means for sources ready to provide data, to transmit a data ready enabling signal to said interval times means so that data from a ready source is sampled at a predetermined rate for entry into said data memory means, and to indicate completion of storage of such data by transmitting an interrupt signal to said output processor;

said output processor being responsive to said interrupt signal to read the corresponding stored data out of said data memory means to said second peripheral interface means for transmission to said utilization means and to place a flag in said data memory means to indicate to said acquisition processor that the data memory means is again ready to receive data from one of said first peripheral interface means; and said acquisition processor being responsive to said flag when it next polls the data memory means to resume polling of said first peripheral interface means for sources ready to provide data, whereby said system operates in a time-sharing manner to acquire, store, and read out data from a plurality of sources to one or more utilization means.

4,547,846

ACCESSORY INTERFACE CIRCUIT FOR UNIVERSAL MULTI-STATION DOCUMENT INSERTER

Robert K. Gottlieb, Bridgeport, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Apr. 6, 1983, Ser. No. 482,731
Int. Cl.[4] B41L *43/00;* **B65B** *57/04*
U.S. Cl. 364—138 **25 Claims**

1. A method for interfacing with envelope handling accessories for a universal multi-station document inserter for performing predetermined functions with envelopes having documents inserted therein by the multi-station document inserter, comprising the steps of:

providing an accessory interface microcomputer;

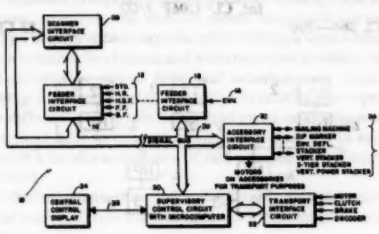
arranging accessories responsive to output signals from the accessory interface microcomputer in an array;

providing envelope sensing means in the array for providing clock signals to the accessory interface microcomputer;

storing data words in the accessory interface microcomputer, certain of the data words indicating particular combinations of signals from said envelope sensing means for detecting envelope jams and other data words indicat-

ing the type of accessory, its output location, clock data relating to the particular accessory, and indicating the accessories to be actuated by an envelope entering the array;

storing envelope handling programs in the accessory interface microcomputer; and



actuating the accessories of the accessory array under control of the accessory interface microcomputer in accordance with the data words stored therein in response to clock signals from the envelope sensing means.

4,547,847

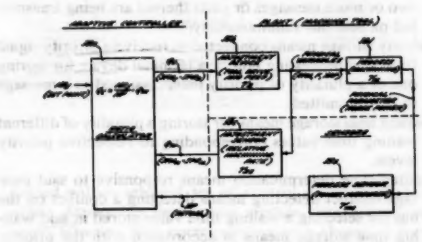
ADAPTIVE CONTROL FOR MACHINE TOOLS

Eugene A. Olig, and Lee R. Ladwig, both of Fond du Lac, Wis., assignors to AMCA International Corporation, Fond du Lac, Wis.

Continuation-in-part of Ser. No. 386,481, Jun. 9, 1982, Pat. No. 4,509,126. This application May 26, 1983, Ser. No. 498,466

Int. Cl.[4] G06F *15/46*; G05B *13/02*

U.S. Cl. 364—148 **73 Claims**



1. The method of adaptively controlling a plant process to maintain the value of a process parameter [M] substantially in agreement with the value of a desired set point [m], the plant having an automatic adjustment device [33*b*] responsive to a command signal [Q_c] to change at least one physical variable [Q], changes in said variable [Q] in turn causing the parameter [M] to change, the response of the parameter [M] to the variable [Q] being time variant in a fashion that is not predeterminable, said method comprising:

(a) supplying a command signal [Q_c] to said adjustment device [33*b*] so that the latter produces the physical variable [Q],

(b) sensing the actual value of the physical parameter [M], and

said method being characterized by and including

(c) obtaining an estimate [Q_p] of the present value of the physical variable [Q], and thereafter

(d) correctively changing said command signal [Q_c] to take on a new value [Q_{cn}] equal to the estimate [Q_p] of the present value of the physical variable [Q] multiplied by the ratio of the set point value [m] to the actual value of the physical parameter [M].

4,547,848

ACCESS CONTROL PROCESSING SYSTEM IN COMPUTER SYSTEM

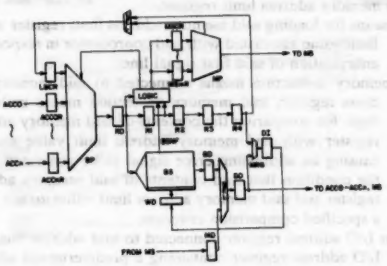
Hidehiko Nishida, Tokyo; Minoru Koshino, Yokohama; Terutaka Tateishi, Kawasaki, and Akira Hattori, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 30, 1983, Ser. No. 509,869

Claims priority, application Japan, Jun. 30, 1982, 57-112862

Int. Cl.[4] G06F *13/00*

U.S. Cl. 364—200 **7 Claims**



1. An access control processing system in a computer system having a buffer storage, a main storage and access requesting units which generates access requests for requested data, access being made to the main storage only if requested data is not found in the buffer storage, said access control processing system comprising:

buffer storage access request registers, each of said buffer storage access request registers operatively connected to one of the access requesting units, for storing access requests for the buffer storage;

a buffer storage priority determination circuit, operatively connected to the buffer storage and said buffer storage access request registers, for determining priority between access requests for the buffer storage;

main storage access request registers, operatively connected to said buffer storage and the buffer storage priority determination circuit, for storing access requests for the main storage;

a main storage priority determination circuit, operatively connected to the main storage, said buffer storage access request registers and said main storage access request registers, for determining priority between access requests for the main storage independently of the buffer storage priority determination circuit.

4,547,849

INTERFACE BETWEEN A MICROPROCESSOR AND A COPROCESSOR

Glenn Louie, 274 Andsbury, Mountain View, Calif. 94043; Rafi Retter, 19 Adam Hacohen St., Neve Shaanan, Haifa 32714, Israel, and James Slager, 6230 Pasos Los Cerritos, San Jose, Calif. 95120

Continuation of Ser. No. 328,973, Dec. 9, 1981, abandoned. This application Aug. 17, 1984, Ser. No. 615,081

Int. Cl.[4] G06F *15/16*

U.S. Cl. 364—200 **4 Claims**

1. For use with a main memory and an interface between a master microprocessor and a slave coprocessor, said master microprocessor, said slave coprocessor, and said memory being connected to a common memory address bus and a comon data bus, wherein data transfers between said slave coprocessor and said main memory all pass through said master microprocessor and main memory address information is subjected to a protection mechanism in said master microprocessor, a data channel within said master microprocessor comprising:

control logic connected to a first signal line for receiving

signals from said coprocessor, and to a second signal line (COACK#) for sending signals to said coprocessor,

said control logic including first transferring means;

said control logic including timing means connected to said first transferring means for generating timing signals defining cycles including a write cycle, a read cycle, an I/O read cycle, and an I/O write cycle;

a memory address register connected to said address bus,

said memory address register containing an address therein corresponding to a main memory address;

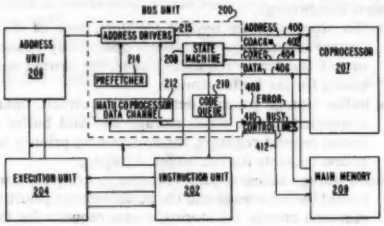
a memory address limit register;

means for loading said memory address limit register with a limit value associated with said coprocessor in response to energization of said first signal line;

memory protection means connected to said memory address register, said memory protection means including logic for comparing the contents of said memory address register with said memory address limit value and for causing an addressing error signal to be generated upon the condition that said contents of said memory address register and said memory address limit value do not meet a specified comparision criterion,

an I/O address register connected to said address bus, said I/O address register containing a predetermined address therein corresponding to an I/O address of said coprocessor reserved for data transfers to and from said main memory;

a data buffer register for storing data therein, said data buffer register being connected to said data bus and to said control logic;



said first transferring means including second means responsive to said timing means and said first signal line (COREQ) for transferring data between said main memory and said data buffer register during said read cycle, said data being accessible at an address location in said main memory corresponding to said address stored in said memory address register,

said first transferring means including third means for energizing said second signal line (COACK#) in response to energization of said first signal line (COREQ) by said coprocessor, to thereby acknowledge a coprocessor request during said read cycle;

incrementing means connected to said timing means, to said first transferring means and to said memory address register, responsive to said first transferring means in said control logic, operative during said read cycle upon the completion of data transfer to said data buffer, for incrementing the contents of said memory address register; and,

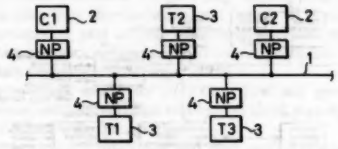
gating means connected to said data buffer register, said data bus, said I/O address register, said address bus, and to said timing means, operative during said I/O write cycle, for placing said data in said data buffer register on said data bus and for placing said predetermined address in said I/O address register on said address bus to thereby transmit said data in said data buffer register and said predetermined address corresponding to said I/O address of said coprocessor to said slave coprocessor.

4,547,850

PRIORITY CONTROL METHOD AND APPARATUS FOR COMMON BUS OF DATA PROCESSING SYSTEM

Hideaki Genma, Hadano, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 8, 1983, Ser. No. 549,806
Claims priority, application Japan, Nov. 17, 1982, 57-200435
Int. Cl.[4] G06F *3/00*
U.S. Cl. 364—200 **13 Claims**



1. A contention system for controlling the transmission of messages on a bus, including at least one processing unit, a plurality of terminal devices, a bus, and a plurality of node processors respectively connecting said processing unit and said terminal devices in common to said bus, each of said node processors comprising:

message transmission means connected to receive data from said processing unit or a terminal device for applying said data as part of a message to said bus;

message reception means connected to receive a message including data from said bus for applying the data in said message to said processing unit or a terminal device;

message conflict detecting means connected to said bus for detecting that said message transmission means has applied a message to said bus at substantially the same time as at least one other node processor has applied a message to said bus with the result that a conflict occurs in which two or more messages or parts thereof are being transmitted on said bus simultaneously;

priority storage means connected to receive a priority signal from said processing unit or a terminal device for storing one of a plurality of priority levels assigned to a message to be transmitted;

waiting time storage means for storing a plurality of different waiting time values corresponding to respective priority levels;

waiting time determination means responsive to said message conflict detecting means detecting a conflict on the bus for selecting a waiting time value stored in said waiting time storage means in accordance with the priority level stored in said priority storage means, and including means for generating a transmission enable signal upon expiration of said selected waiting time; and

transmission control means responsive to a transmission enable signal from said processing unit or terminal device or from said waiting time determination means for controlling said message transmission means to apply a message to said bus, and including means responsive to said message conflict detecting means detecting a conflict on the bus for temporarily inhibiting said message transmission means until said transmission enable signal is generated by said waiting time determination means.

4,547,851

INTEGRATED INTERACTIVE RESTAURANT COMMUNICATION METHOD FOR FOOD AND ENTERTAINMENT PROCESSING

Lawrence G. Kurland, 26 Farmington La., Melville, N.Y. 11747

Filed Mar. 14, 1983, Ser. No. 474,983
Int. Cl.[4] G06F *3/04, 15/24, 15/44*
U.S. Cl. 364—401 **11 Claims**

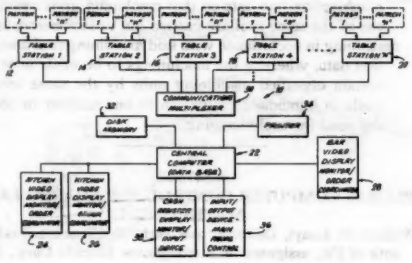
1. A method of interactively integrating food and entertainment patron selection and interaction for a plurality of table

stations in a restaurant communication system comprising the steps of remotely retrievably storing and processing information comprising a plurality of displayable food menu modules and entertainment modules at a central data base, providing a plurality of down-line loadable multipurpose table station terminals at a plurality of said table stations, each of said table station terminals comprising microprocessor means, local storage means, selection and control means and local common video type display means capable of providing a video display of patron selected food menu and entertainment modules, each of said retrievably stored food and entertainment modules comprising a different set of control instructions corresponding to a different patron selectable food menu or entertainment function, said microprocessor means being operable in accordance with a locally stored one of said selected sets of control instructions;

individually patron selecting a displayable remotely stored food menu module via said table station terminal selection means;

down-line loading said patron selected corresponding set of control instructions to the selecting table station terminal for local storage thereof;

locally displaying food menu selection data corresponding to said patron selected food menu module on said common video type display means in response to said down-line



loaded patron selected set of control instructions, said video displayable food menu module data comprising menu selection data corresponding to a choice of food items to be ordered; individually patron selecting at least one of said video displayed food items for remotely patron ordering said selected food items; transmitting said at least one patron ordered food selection back to said central data base for central processing of said order; individually patron selecting a displayable remotely stored entertainment module via said food ordering table station terminal for video display on said common video type display means at said food ordering table station terminal; down-line loading said patron selected corresponding set of control instructions to said food ordering table station terminal for local storage thereof; locally video displaying entertainment data corresponding to said patron selected entertainment module on said food ordering table station terminal common video type display means in response to said down-line loaded selected set of control instructions to said food ordering table station terminal for enabling interaction with said video displayed entertainment data while said food order is being processed; whereby each table station terminal may independently provide both interactive entertainment and food selection on a common video type display terminal in cooperation with a central data base.

4,547,852

ENGINE CONTROL APPARATUS AND CONTROL METHOD

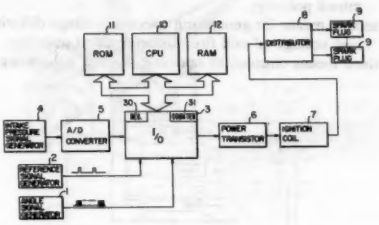
Hiroshi Kamifuji; Tomoo Ito, both of Katsuta; Haruhiko Kobayashi, Ibaraki, and Tomiya Itakura, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Eng. Co., Ltd., Katsuta, both of, Japan

Filed Feb. 10, 1983, Ser. No. 465,618

Claims priority, application Japan, Feb. 17, 1982, 57-22846

Int. Cl.[4] F02P *5/08;* **F02B** *5/02*

U.S. Cl. 364—431.04 **8 Claims**



1. An ignition advance angle control apparatus for an engine comprising:

(a) at least two parameter detecting means, each for detecting a respective parameter indicative of an operating condition of an engine;

(b) ignition control means for controlling the ignition timing of said engine;

(c) a fixed data memory in which are mapped ignition advance angles as basic amounts of control predetermined on the basis of the two parameters detected by the two parameter detecting means in order to determine the ignition advance angle on which operation of said ignition control means is to be based;

(d) a correction coefficient data memory in which are mapped correction coefficients having values of 1 down to nearly zero corresponding to increasing values of the difference between the previous ignition advance angle and the ignition advance angle which is determined in each period at which said fixed data memory is read;

(e) a microprocessor for adding to said previously determined ignition advance angle at each read period of said fixed data memory a value which is a function of the correction coefficient stored in said correction coefficient data memory in correspondence to said difference; and

(f) output means responsive to an ignition advance angle calculated by said microprocessor for producing an actual output representing the calculated ignition advance angle and for supplying the same to said ignition control means.

4,547,853

ELECTRONIC POSTAGE METER RESET CIRCUIT

Alton B. Eckert, Norwalk, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 13, 1982, Ser. No. 434,097

Int. Cl.[4] G06F *1/00*

U.S. Cl. 364—464 **9 Claims**

1. In an electronic postage meter energized by a source of operating voltage and having printing means for printing postage and accounting means coupled to said printing means for accounting for postage printed by said printing means, the improvement comprising:

said accounting means coupled to said source of operating voltages and including computer means having a reset terminal energized by a first predetermined reset terminal voltage to enable said computer means to be conditioned to output data and said reset terminal further energized by a second predetermined reset terminal voltage to disable

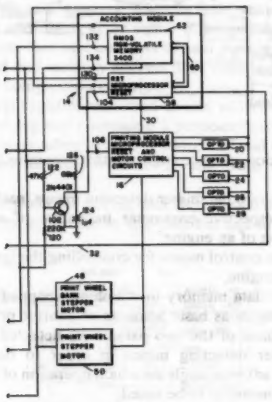
said computer means from being conditioned to output data;

non-volatile memory means operatively coupled to said computer means for storing accounting data when said source of operating voltage is not operating to energize said accounting means, said non-volatile memory having a terminal which when energized by a voltage of a first predetermined polarity enables said non-volatile memory to have data written into memory locations by said computer means;

first means for generating a voltage of said first predetermined polarity;

second means for generating a second voltage differing from said voltage of said first predetermined polarity;

third means coupled to said first voltage generating means,



said second voltage generating means and said non-volatile memory terminal for applying said voltage of said first predetermined polarity to said non-volatile memory terminal when said source of operating voltage is above a predetermined level and for applying said second voltage to said memory write enable terminal when said source of operating voltage is below a predetermined level; and

fourth means coupled to said third means and to said computer reset terminal for energizing said computer means reset terminal with said first predetermined reset terminal voltage after said non-volatile memory terminal is energized by said voltage of a first predetermined polarity such that said computer means is conditioned to output data after said non-volatile memory terminal has been energized to enable data to be written into memory locations by said computer means.

4,547,854

METHOD OF CONTROLLING LINEUP OF TOOLS IN NUMERICAL CONTROL MACHINE TOOL

Hideo Hashimoto, Konan; Katsuhiko Tomori, Kagamihara, and Yuji Sano, Hashima, all of Japan, assignors to Yamazaki Machinery Works, Ltd., Niwa, Japan

Filed Oct. 27, 1982, Ser. No. 437,169

Claims priority, application Japan, Nov. 5, 1981, 56-178075

Int. Cl.⁴ G06F *15/46;* G05B *19/18*

U.S. Cl. 364—474 **9 Claims**

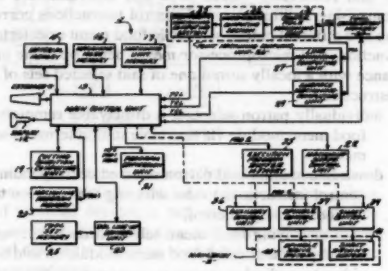
1. A method of controlling a lineup of tools in a numerical control machine tool comprising the steps of:

classifying a machining operation into a plurality of machining units each machining unit corresponding to a portion of the machine operation to be carried out, in accordance with a desired workpiece shape;

storing, in a tool combination memory, tool combination line data containing the names of tools in the sequences for use for respective machining units;

selecting the machining units to be used to machine a particular workpiece so that corresponding tool combination line data corresponding thereto are read out as units from said tool combination memory;

storing, in a machining program memory, tool combination line data read out from said tool combination memory corresponding to the selected machining units for respective machining units;



forming machining tool combination data in a tool set memory by rearranging, on the basis of the tools, said tool combination line data so that machining units calling for use of the same tool are carried out in succession; and

machining in accordance with said machining tool combination data, whereby the machinings to be made in at least certain classified machining units by the same tool are made in immediate succession to one another to obviate the need for tool changing.

4,547,855

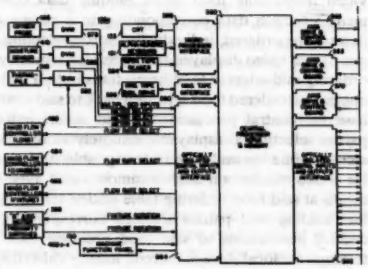
PLURAL COMPUTER CONTROL FOR SHARED LASER MACHINING

William D. Lanyi, Delmont, and Jack W. Clements, Trafford, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 1, 1982, Ser. No. 414,204

Int. Cl.⁴ B23K *26/12;* G05D *25/00*

U.S. Cl. 364—474 **24 Claims**



1. Plural computer controlled apparatus for laser machining at least first and second work pieces, said plural computer controlled apparatus comprising:

(a) a single, time shared laser source for emitting a laser beam in the form of laser pulses of a controllable frequency and pulse width;

(b) beam directing means disposed to intercept the laser beam, and operative in a first mode for directing the laser beam along a first laser path, and in a second mode for

directing the laser beam along a second laser path distinct from said first laser path;

(c) first and second work stations for respectively receiving the first and second work pieces and disposed to intercept said first and second laser paths respectively;

(d) first and second optical means associated respectively with said first and second laser paths for focusing the laser beam onto the first and second work pieces; and

(e) first and second computer control means for controlling respectively the laser machining of the first and second work pieces, and each operatively coupled to said beam directing means for disposing said beam directing means to operate in said first and second modes respectively, said first and second computer control means coupled to each other to permit only one of said first and second computer control means to gain control of said beam directing means to operate in its corresponding mode, while excluding the other of said first and second computer control means from gaining access to said beam directing means.

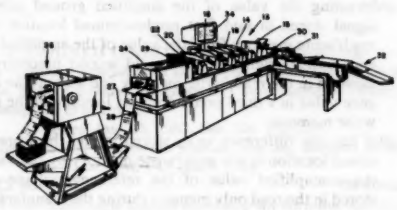
4,547,856

UNIVERSAL MULTI-STATION DOCUMENT INSERTER

Peter N. Piotroski, New Canaan, and John M. Gomes, Bridgeport, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jul. 1, 1982, Ser. No. 394,388
Int. Cl.[4] B65H *39/02*; G08B *21/00*
U.S. Cl. 364—478 **34 Claims**

MICROFICHE APPENDIX INCLUDED
(6 Microfiche, 292 Pages)



1. A method for providing a universal multistation document inserter for inserting documents into an envelope, including the steps of:

providing a central processor;

providing a plurality of modular feeder stations for feeding documents in response to signals from the central processor;

providing each feeder station with a unique address;

storing predetermined feeder programs in distributed processors associated, respectively, with each of the modular feeder stations, each of the feeder programs providing instructions to the associated feeder station for feeding documents;

storing a supervisory program in the central processor operative for providing address and command signals to the distributed processors of the feeder stations;

interconnecting the central processor and the distributed processors for the communication of signals so that upon receipt of the proper address and command signals at a particular distributed processor, the associated feeder station will execute its document feeding functions under control of the central processor in accordance with instructions programmed in the distributed processor;

transporting a coded document from feeder station to feeder station; and

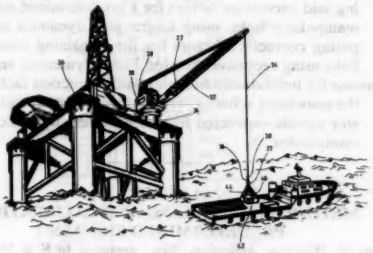
scanning the coded document and inputting the coded information to the central processor for controlling the operation of each feeder station.

4,547,857

APPARATUS AND METHOD FOR WAVE MOTION COMPENSATION AND HOIST CONTROL FOR MARINE WINCHES

George H. Alexander, 3114 Lazy Pine, LaPorte, Tex. 77571

Filed Jun. 23, 1983, Ser. No. 507,102
Int. Cl.[4] G06G *7/48*
U.S. Cl. 364—505 **35 Claims**



28. A method of lifting a load from a vessel which is in motion relative to the lifting crane, comprising:

connecting the load to the crane hoist rope;

applying a tension to the hoist rope less than the weight of the load to be lifted;

maintaining this tension constant as the load on the vessel rises and falls relative to the crane;

determining data representing the direction of vertical motion, vertical displacement, vertical velocity and vertical acceleration of the load relative to the crane;

comparing this data to standard sea state data to determine the optimum time to initiate lifting of the load; and

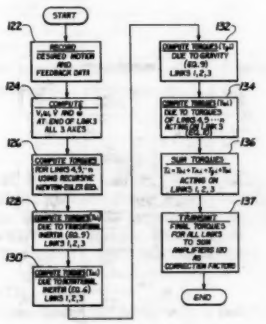
automatically initiating such lift at the determined optimum time by electronic means.

4,547,858

DYNAMIC CONTROL FOR MANIPULATOR

Dan Horak, Columbia, Md., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 13, 1983, Ser. No. 503,921
Int. Cl.[4] G06F *15/46*; G05B *19/42*
U.S. Cl. 364—513 **20 Claims**



1. In combination with a manipulator control system having a multiple link manipulator, a central processing unit having adequate storage and computational means for generating motion signals indicative of the desired motion of the manipulator links, a linear dynamic control loop for generating actuator signals controlling actuators moving the individual manipulator links, and sensors responsive to position and motion of said manipulator links for generating feedback signals to the central processing unit and the linear dynamic control loop, a

nonlinear dynamics control loop for correcting the actuator signals for the nonlinear dynamics of the manipulator characterized by:

nonlinear dynamics control computer means for generating correction factors for each of the actuators moving the manipulator links in response to the motion signals generated by the central processing unit and the feedback signals, said nonlinear dynamics control computer computing said correction factors for a predetermined number of manipulator links, using Lagrangian dynamics and computing correction factors for the remaining manipulator links using recursive Newton-Euler dynamics; and

means for individually summing said correction factors with the associated actuator signals to generate corrected actuator signals, corrected for the nonlinear dynamics of the manipulator.

4,547,859

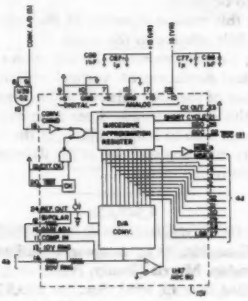
METHODS FOR SCALING AND CALIBRATING PREDETERMINED SIGNALS

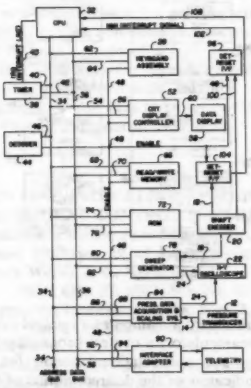
Gene D. Wiggins, Arlington, Tex., assignor to S & W Instruments, Inc., Dallas, Tex.

Division of Ser. No. 262,761, May 11, 1981, Pat. No. 4,456,963. This application Apr. 6, 1984, Ser. No. 597,741

Int. Cl.[4] G06J *1/00*; G06F *15/20*; G01L *3/00*

U.S. Cl. 364—571 **2 Claims**





1. In apparatus for measuring and displaying indicated power of a reciprocating piston machine including a common data bus, a common address bus, a decoder, a central processing unit, a read only memory, a read/write memory, a keyboard assembly, a display controller, a display device, a pressure data acquisition and scaling system, set/reset flip flops and a timer,

an improved method of calibrating said pressure data acquisition and scaling system to eliminate inaccuracies due to temperature related changes in component values and changes in component values due to component aging comprising the following steps which are performed just prior to reading the value from a pressure transducer providing pressure indication from a cylinder of the reciprocating piston machine:

switching a signal source selector means to a ground reference signal;

applying the ground reference signal to an instrumentation amplifier where the ground reference signal is amplified;

sampling the amplified ground reference signal and applying the amplified ground reference signal to an analog to digital converter, the output of which is read by the central processing unit and the value stored in a first predetermined location in said read/write memory;

switching the signal source selector means to a reference voltage signal whose value has been predetermined to be of such an amplitude, after amplification by the instrumentation amplifier, to be near but not greater than the full scale input range of said analog to digital converter;

applying the reference voltage signal to said instrumentation amplifier where said reference voltage signal is amplified;

sampling the amplified reference voltage signal and applying the amplified reference voltage signal to said analog-to-digital converter, the output of which is read by the central processing unit and the value stored in a second predetermined location in said read/write memory;

subtracting the value of the amplified ground reference signal stored in said first predetermined location in the read/write memory from the value of the amplified reference voltage signal stored in said second predetermined location in the read/write memory and storing the difference value in a third predetermined location in the read/-write memory;

dividing said difference value stored in said third predetermined location in the read/write memory by the value of the unamplified value of the reference voltage signal stored in the read only memory during the manufacture of the apparatus; and

writing the value resulting from the division operation into a fourth predetermined location in said read/write memory, said value representing the exact amount the pressure transducer signal has been amplified by the data acquisition system and said value is used by the central processing unit to calculate the true and correct value of pressure applied to the pressure transducer.

4,547,860

COMPUTER KEYBOARDS WITH FEW KEYS DESIGNATING HUNDREDS OF FUNCTIONS

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleand, La.

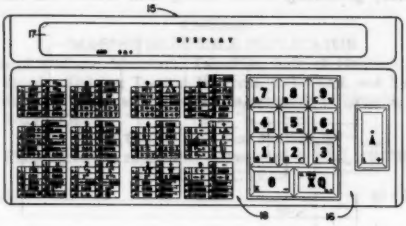
Filed Jan. 21, 1983, Ser. No. 459,998

Int. Cl.[4] G06F *3/02*

U.S. Cl. 364—709 **22 Claims**

1. A computer keyboard system for a computer operable to execute a large number of functions in response to keyboard selection of the various accessible functions, comprising in combination, a set of keyboard keys numbering X including ten digit keys 0 to 9, means for operating the keyboard in a first numerical computer mode of operation activating the keys for executing a corresponding set of designated functions with a single keystroke including the activation of the digit keys for sequentially entering decimal digits on successive single keystrokes to form multi-digit numerical words, and means including in said set of keys a further execute key with corresponding operation means for shifting the mode of action from the first operation mode to a second multi-function computer mode

requiring a plurality n of sequential non-simultaneous keystrokes of any selected ones of said X keys for execution of a



further set of designated functions, whereby the keyboard has the capability of processing X^n+X designated functions.

4,547,861

COMBINED LOGIC SIGNALS GENERATOR

André Laviron, Fontaine les Dijon, and Claude Berard, Is sur Tille, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

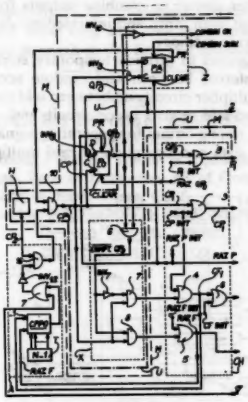
Filed Jan. 25, 1982, Ser. No. 342,223
Claims priority, application France, Jan. 26, 1981, 81 01392
Int. Cl.⁴ G06F *7/38*
U.S. Cl. 364—715 **20 Claims**

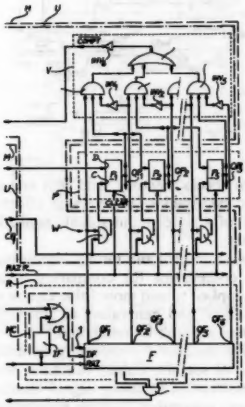
1. A combined logic signals generator for forming combinations of p output signals at the logic level 1 N-p output signals at the logic level 1 amongst N outputs (QP1, . . . QPN) of the generator on which the p logic signals of level 1 and N-p logic signals of level 0 are available, N and p being constants, wherein it comprises:

an assembly (P) of N storage means (P1, P2 . . . PN), the storage means being allocated position 1 to position N, the combinations of p output signals at the level 1 and N-p signals at the level 0 being supplied at the outputs (QP . . . QPN) with such storage means of positions 1 to N;

means (CH) to introduce into the storage means (P1, P2 . . . PN) the logic levels corresponding to a predetermined starting combination of signals;

control means (M) to locate the storage means Pi, which is defined as being a means whose output signal is at the logic level 1 and which is immediately followed by the storage means P_{i+1} whose output signal is at the logic level 0, the position i being as low as possible, the means M enabling a succession of signals of logic level 1 to be brought to all the storage means which precede the means Pi, starting with a storage means of position 1 up to a means of position n inclusive, n being equal to the number of logic levels 1 existing on the storage means preceding the means Pi, such succession being completed if necessary with levels 0 after the storage means of position n and before the means of position i, the control means (M) also enabling the logic level of the storage means Pi to be replaced by a logic level 0 and the logic level of the storage means Pi+1 by a logic level 1, the repeated application of e control means M supplying the combinations which follow the predetermined combination; and





means (A) to stop the generation of the combinations after another predetermined combination.

4,547,862

MONOLITHIC FAST FOURIER TRANSFORM CIRCUIT

George W. McIver, Redondo Beach; Barry H. Whalen, Rancho Palos Verdes, and Bruce L. Troutman, Irvine, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jan. 11, 1982, Ser. No. 338,733
Int. Cl.⁴ G06F *15/332*
U.S. Cl. 364—726 **19 Claims**

1. A monolithic circuit for performing a fast Fourier transform (FFT), said circuit comprising:

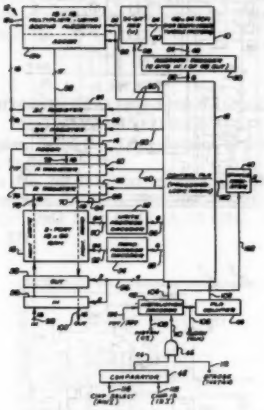
a fast multiplier employing a modified version of Booth's algorithm;

a first adder circuit to combine products from said multiplier circuit;

a read-only memory for storage of FFT twiddle factors for input to said fast multiplier circuit;

a two-port random access memory, having a read bus and a write bus, for storage of input data, intermediate results and output data in an in-place FFT operation;

a data input register connectable to the write bus of said random access memory;
a data output register connectable to the read bus of said random access memory;
a second adder circuit to combine outputs from said first adder circuit with input and intermediate data from said random access memory;
a stack of registers to provide temporary storage for data being transferred between said random access memory and said multiplier circuit and between said random access memory and said second adder circuit; and
a control and timing circuit for generating signals to control transfer of data and operation of said multiplier circuit,



said random access memory, said first and second adder circuits, and said stack of registers, to effect computation of the FFT of a set of input signals applied to said data input register;
and wherein said control and timing circuit includes
an address comparator for comparing a chip selection address supplied to said monolithic circuit with a unique chip identifier, and generating an instruction enabling signal when a match is found, and
an instruction decoder for receiving an instruction code indicative of specific circuit functions to be initiated, and an instruction enabling signal from said address comparator, to confirm that the instruction is intended for this particular circuit.

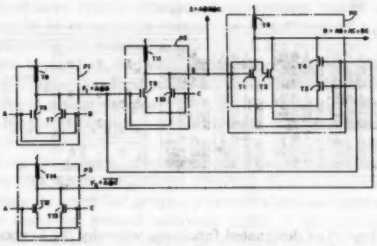
4,547,863

INTEGRATED CIRCUIT THREE-INPUT BINARY ADDER CELL WITH HIGH-SPEED SUM PROPAGATION

Joël S. G. Colardelle, Les Ulis, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 7, 1983, Ser. No. 502,029
Claims priority, application France, Jun. 9, 1982, 82 10025
Int. Cl.⁴ G05F 7/50
U.S. Cl. 364—784 **3 Claims**

1. A binary adder cell for summing three input binary variables A, B and C and having a sum output S and a carry output R comprising:
a first two-input complemented exclusive-OR gate having a first input coupled to said input variable A, a second input coupled to said input variable B and an output for providing a first intermediate variable $F_1=A\oplus B$;
a second two-input complemented exclusive-OR gate having a first input connected to said output of said first gate, a second input coupled to said input variable C and an output for providing said sum output $S=A\oplus B\oplus C$;
a third two-input complemented exclusive-OR gate having a first input coupled to said input variable A, a second input coupled to said input variable C and an output for providing a second intermediate variable $F_3=A\oplus C$; and
a carry generating circuit having first, second and third



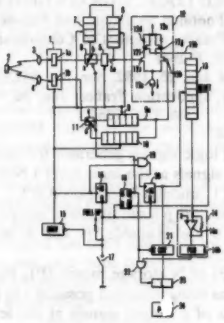
inputs respectively connected to the outputs of said second gate, of said first gate and of said third gate and an output for providing said carry output $R=\overline{S}(\overline{F}_1+F_1\overline{F}_3)+SF_1F_3$.

4,547,864

CORRELATION DETECTING DEVICE

Takashi Kawabata, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 27, 1982, Ser. No. 452,876
Claims priority, application Japan, Jan. 7, 1982, 57-1490
Int. Cl.⁴ G06G 7/19; G06J 1/00
U.S. Cl. 364—824 **18 Claims**



1. An image signal processing device used in an image correlation detecting device comprising:
first and second analog shift registers for respectively retaining and shifting signals as an image of an object, said first and second analog shift registers forming respectively closed loops to shift signals in successive cycles, the signals in the bits in the first analog shift register and that in the second analog shift register being arranged to be offset relative to each other;
comparison means for comparing said signals of the image for every corresponding bit of the first and second analog shift registers and producing a comparison value as an output;
one of said shift registers including stepping means for shifting the signals in the bits said first and second analog shift registers relative to each other so as to vary the relationships between corresponding bits for every cycle of the analog shift registers; and
adder means for adding outputs of said comparison means, said adder means making the addition for every 1 loop of

the analog shift registers and producing a result of said addition as a correlation signal.

4,547,865

MAGNETIC BUBBLE REPLICATOR

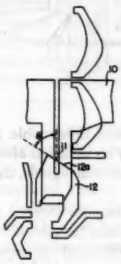
Naoki Kodama; Masatoshi Takeshita, both of Hachioji; Ryo Suzuki, Kodaira; Teruaki Takeuchi, Kokubunji, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 4, 1983, Ser. No. 538,787

Claims priority, application Japan, Oct. 4, 1982, 57-173218

Int. Cl.[4] G11C *19/08*

U.S. Cl. 365—12 **10 Claims**



1. A magnetic bubble replicator comprising:

a soft magnetic material element for propagating a magnetic bubble along a predetermined edge thereof in response to a change in a direction of an external magnetic field; and

a hairpin-shaped conductor arranged in superposition to said soft magnetic material element, an angle between a slit of said hairpin-shaped conductor and a path of propagation of the magnetic bubble of said soft magnetic material element being selected to be between 45 degrees and 60 degrees.

4,547,866

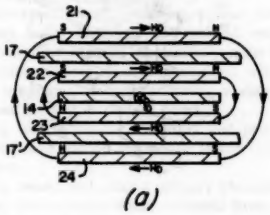
MAGNETIC THIN FILM MEMORY WITH ALL DUAL FUNCTION FILMS

Olin S. Lutes, and Wayne L. Walters, both of Bloomington, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 507,391, Jun. 24, 1983, abandoned. This application May 14, 1984, Ser. No. 610,202

Int. Cl.[4] G11C *11/15*

U.S. Cl. 365—173 **26 Claims**



(a)

1. Symmetrical planar coupled film magnetic memory cell structure comprising:

a central flat "digit" conductor line;

first and second flat magnetic films symmetrically situated above and below said central conductor and insulated therefrom said films having uniaxial anisotropy where the easy axis of magnetization is at right angles to the digit line direction;

second and third flat "word" conductor lines symmetrically situated outside said first and second magnetic films, respectively, and insulated therefrom;

and third and fourth flat magnetic films symmetrically situated outside said second and third "word" conductor lines, respectively, and insulated therefrom, said films having the same easy axis and approximately the same anisotropy strength as the first and second films.

4,547,867

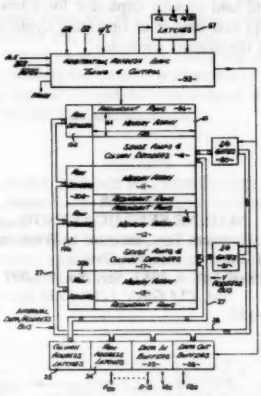
MULTIPLE BIT DYNAMIC RANDOM-ACCESS MEMORY

Edmund A. Reese, Portland; Dieter W. Spaderna, and Stephen T. Flannagan, both of Beaverton, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 192,740, Oct. 1, 1980,. This application Apr. 11, 1983, Ser. No. 483,887

Int. Cl.[4] G11C *13/00*

U.S. Cl. 365—189 **5 Claims**



1. In a dynamic memory, a circuit for arbitrating between a first and second binary signal comprising:

a strobe signal generation means for generating a strobe signal upon receipt of said first or second signal;

a bistable circuit the state of which is determined by the state of one of said first or second signals;

isolation means for coupling said one of said signals to said bistable circuit and for isolating said signal from said bistable circuit upon occurrence of said strobe signal, said isolation means coupled to receive said strobe signal;

whereby said circuit quickly arbitrates between said signals.

4,547,868

DUMMY-CELL CIRCUITRY FOR DYNAMIC READ/WRITE MEMORY

Jimmie D. Childers, Missouri City, and Adin E. Hyslop, Houston, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 26, 1984, Ser. No. 634,900

Int. Cl.[4] G11C *7/00*

U.S. Cl. 365—203 **11 Claims**

1. A semiconductor memory device comprising:

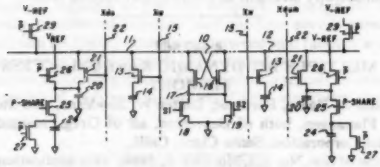
an array of rows and columns of storage cells, each storage cell having a storage capacitor,

at least one row of dummy cells adjacent said array of storage cells, each dummy cell having a capacitor, and an access transistor connecting the dummy capacitor to a column line,

addressing means for activating one of said rows of storage

cells and activating said row of dummy cells at a first time in an operating cycle,

precharge means coupled to said dummy capacitor at a time prior to said first time in and operating cycle, and decoupled from said dummy capacitor at said first time and for



a period thereafter, to thereby precharge said dummy capacitor to a reference voltage,

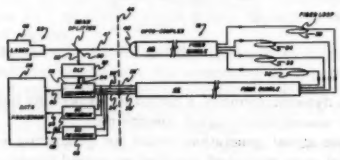
and a charge-sharing circuit including a second capacitor coupled to said dummy capacitor for a time period just before said first time in an operating cycle to change the charge in the dummy capacitor.

4,547,869

MARINE SEISMIC SENSOR

Carl H. Savit, Houston, Tex., assignor to Western Geophysical Company of America, Houston, Tex.

Filed Apr. 4, 1983, Ser. No. 482,007
Int. Cl.⁴ G01V *1/16, 1/38*
U.S. Cl. 367—149 **6 Claims**



1. An apparatus for resolving the magnitude and direction, in a vertical plane, of seismic waves propagating in a fluid medium, comprising:

means for launching a coherent beam of monochromatic light;

a sensor array disposed substantially in a vertical plane composed of a set of at least three active optical-fiber pressure sensors for receiving and modulating said coherent beam in proportion to the pressure in said fluid medium to provide modulated beams, said sensors having an essentially common light-beam input and separate light-beam outputs;

means for receiving said modulated beams from said separate light-beam outputs and for separately combining interferometrically each said modulated light beam with a reference light beam to derive AC signal components representative of transient pressure variations due to seismic waves in said fluid medium;

means for combining interferometrically said separate modulated light beams with each other to derive DC signal components representative of the hydrostatic pressure differences between the sensors of the array; and

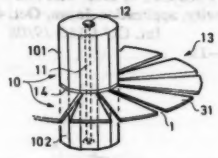
means for resolving the direction and magnitude of signal propagation by vectorially combining said AC and DC signal components.

4,547,870

VELOCITY HYDROPHONE

Charles Maerfeld, Antibes; Michel Josserand, Villeneuve-Loubet, and Claude Gragnolati, Cannes, all of France, assignors to Thomson-CSF, Paris, France

Filed Jan. 24, 1984, Ser. No. 573,454
Claims priority, application France, Jan. 28, 1983, 83 01336
Int. Cl.⁴ H04R *17/00*
U.S. Cl. 367—155 **3 Claims**



1. A velocity hydrophone immersible in a fluid for transforming acousting signals, transmitted along a given direction through the fluid, into electrical signals, the hydrophone comprising:

an elongated rod forming an inertial mass and having a longitudinal axis disposed parallel to said given direction;

a plurality of radially oriented spoke-shaped piezoelectric flexible blades cantilevered at their central ends to the rod, the blades respectively laying in planes oriented perpendicularly to said longitudinal axis;

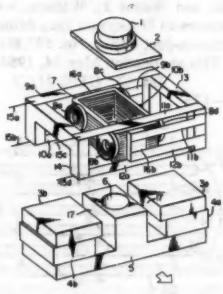
the outward ends of the blades being generally restricted to follow acoustic signals transmitted through the fluid along a direction parallel to the longitudinal axis.

4,547,871

TWO DIMENSIONAL ACTUATOR FOR MOVING OPTICAL MEDIUM OF SCANNING DEVICE

Toshio Sugiyama, Toyokawa, and Yoshio Yamane, Yokohama, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 19, 1982, Ser. No. 340,701
Claims priority, application Japan, Jan. 26, 1981, 56-8471[U]
Int. Cl.⁴ G11B *7/00*
U.S. Cl. 369—44 **19 Claims**



1. An optical scanning system for subjecting a light spot for tracking information on a predetermined recording medium to a focussing and tracking operation, the optical scanning device comprising:

magnetic members for forming at least one magnetic gap extending substantially in a direction of the tracking operation and for generating magnetic flux in the magnetic gap in a direction extending substantially at right angles to both the direction of the focusing operation and the direction of the tracking operation;

driving coil means including first coil means and second coil means driven independent of each other for respectively performing the focusing operation and the tracking operation, both of said first and second driving coil means being placed in a manner such that a portion of each of said first and second coil means are linked by said magnetic flux in said magnetic gap;

said magnetic members including a first magnetic member, a second magnetic member, and a third magnetic member arranged with respect to one another in a direction substantially at right angles to the directions of said focussing and tracking operations and a pair of magnets respectively connected with both said first and second magnetic members and said second and third magnetic members for generating magnetic flux in the magnetic gaps formed between the first and second magnetic members and between the second and third magnetic members; and

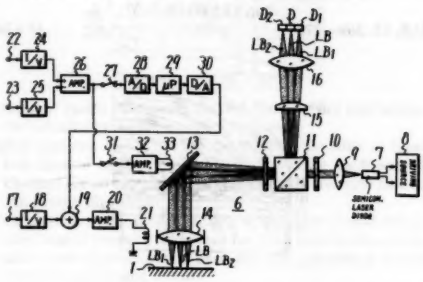
said first coil means is arranged around said second magnetic member to pass through said magnetic gaps.

4,547,872

OPTICAL RECORDING AND REPRODUCING APPARATUS WITH IMPROVED FOCUSSING CONTROL

Fumiaki Henmi, Atsugi, and Yoshio Aoki, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 22, 1982, Ser. No. 401,016
Claims priority, application Japan, Jul. 24, 1981, 56-116653
Int. Cl.⁴ G11B *21/12, 3/82, 7/00*
U.S. Cl. 369—45 **10 Claims**



1. An optical information recording and reproducing apparatus for respectively recording and reproducing an information signal on and from a recording medium, having a recording track, comprising:

beam generator means, including a laser, for generating a primary beam and first and second secondary beams which are spaced apart substantially in the direction along said track on said recording medium with said primary beam impinging on said recording medium between said first and second secondary beams;

focussing lens means for focussing said primary beam and said first and second secondary beams on said recording medium;

detecting means including a primary photodetector for detecting said primary beam reflected from said recording medium and first and second secondary photodetectors for detecting said first and second secondary beams reflected from said recording medium;

beam intensity control means for controlling the intensity of at least said primary beam such that high and low intensities of said primary beam are sufficient to form indicia in said recording medium and to prevent the formation of said indicia, respectively, in accordance with said information signal when said apparatus is in a recording mode, and such that a substantially constant intensity is maintained in at least said primary beam to prevent indicia from being formed in said recording medium when said apparatus is in a reproducing mode;

focussing control means for controlling the position of said focussing lens means in response to output signals of said first and second secondary photodetectors when said apparatus is in said recording mode, including difference signal generator means for generating a difference signal in accordance with a difference between said output signals, and control signal generator means responsive to said difference signal for generating a control signal to control the position of said focussing lens means;

said primary beam and said first and second secondary beams tracing said track in a forward direction to selectively form said indicia along said track when said apparatus is in said recording mode, such that said first secondary beam is reflected from said recording medium at a location along said track ahead of said primary beam in said forward direction where no indicia have yet been formed, and said second secondary beam is reflected from said recording medium at a location along said track behind said primary beam where indicia have already been selectively formed and are in a stable state; and

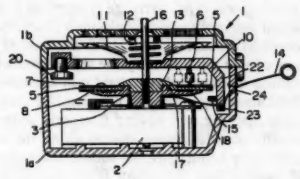
tracking control means for controlling the position of said primary beam in the transverse direction of said recording track in response to said difference signal when said apparatus is in said reproducing mode.

4,547,873

SIMPLIFIED SOUND REPRODUCING DEVICE

Eishi Koike, Sagamihara, Japan, assignor to Ozen Corporation, Tokyo, Japan

Filed Aug. 29, 1984, Ser. No. 645,434
Claims priority, application Japan, Aug. 30, 1983, 58-158183
Int. Cl.⁴ G11B *27/10, 3/78, 17/00*
U.S. Cl. 369—65 **3 Claims**



1. A simplified sound reproducing device comprising:

a casing;

a turntable having a central shaft housed in the casing;

a constant torque spring motor disposed in the casing for driving the turntable;

a record disc having a record face mounted on the turntable, the record disc having a plurality of record grooves each groove positioned in the direction of rotation of the turntable at a point different from adjacent grooves, each groove having a starting point and an end point of sound reproduction;

a tone arm mounted in the casing which travels between a starting point and an end of sound reproduction;

means for urging the tone arm toward the starting point of sound reproduction and away from the record face of the record disc;

a pickup located on the tone arm;

a sound transmitting member disposed on the pickup, the sound transmitting member being capable of approaching or moving away from the record face of the record disc;

a speaker cone attached to the sound trasmitting member;

a stylus force spring disposed in the casing for imparting a stylus force to the pickup through the sound transmitting member;

a pull string wound around the central shaft of the turntable

which energizes the constant torque spring motor when pulled, the pull string simultaneously raising the sound transmitting member by the force against the urging of the stylus force spring and releasing the stylus force imparted on the pickup;

means for frictionally coupling the turntable and record disc giving rise to a slippage in the direction of rotation between the turntable and the disc under a certain extent of force; and

a holding piece engaging the reverse face of the record disc for stopping its further rotation when the sound transmitting member is raised upward.

4,547,874

MOVING COIL TYPE CARTRIDGE MOUNTED ON CANTILEVER WITHIN CENTRAL OPENING OF RING MAGNET

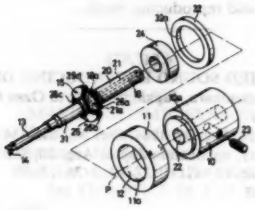
Yoshihisa Mori, and Mitsuru Takashima, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 30, 1982, Ser. No. 413,082

Claims priority, application Japan, Sep. 10, 1981, 56-142838

Int. Cl.⁴ H04R *9/12, 9/16*

U.S. Cl. 369—139 **16 Claims**



1. A moving coil type cartridge comprisng a cantilever for a stylus, a coil assembly which includes a plurality of wire turns and is mounted on said cantilever for movement in response to movement of said cantilever by the stylus, and a field assembly for providing magnetic flux to said coil assembly;

said field assembly comprising a ring-like magnet defining a central opening and having magnetic poles lying in substantially parallel planes spaced along the axis thereof;

said cantilever being disposed substantially along said axis of said magnet and extending from one axial side thereof, said movement of said cantilever being about a fulcrum within said central opening and adjacent to at least one of said pole planes; and

said coil assembly being disposed on said cantilever within said central opening substantially in said one of said planes so that at least a portion of said wire turns induces a voltage by effecting a traverse of lines of a magnetic flux component upon movement of said cantilever about said fulcrum, the directions of (a) said traverse, (b) the turns of said portion, and (c) said lines of magnetic flux component, each considered with respect to the axis of said magnet, being substantially axial, circumferential, and radial, respectively.

4,547,875

OPTICAL RECORDING AND RETRIEVING DISC

Takeo Ohta, Nara; Tatsushi Nakamura, Moriguchi, and Nobuo Akahira, Yawata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

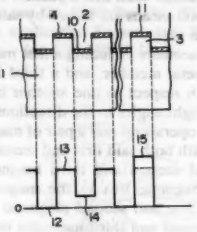
Filed Oct. 7, 1982, Ser. No. 433,264

Claims priority, application Japan, Oct. 9, 1981, 56-161634

Int. Cl.⁴ G11B *7/00*

U.S. Cl. 369—275 **3 Claims**

1. An optical recording and reproducing disc comprising: substrate having groove tracks in the form of concavity or convexity, and a recording film formed on said substrate, said recording film being adapted to change its refractive index or both its refractive index and absorption coefficient, wherein, the phase difference between the light reflected from a recorded portion of said recording film and the light reflected from a non-recorded portion of said recording film is represented by $\Delta\psi$, and the thickness of said recording film is selected such that the value sin $\Delta\psi$ is substantially zero.



4,547,876

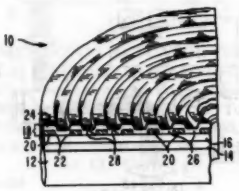
OPTICAL RECORDING MEDIUM AND INFORMATION RECORD AND METHOD OF MAKING SAME

Michael Ettenberg, Freehold, N.J., assignor to RCA Corporation, Princeton, N.J.

Continuation of Ser. No. 293,169, Aug. 17, 1981, abandoned. This application Oct. 14, 1983, Ser. No. 542,028

Int. Cl.⁴ G11B *7/00*

U.S. Cl. 369—275 **18 Claims**



1. An optical recording medium comprising:

a planar light-reflective layer;

a tracking layer overlying said reflective layer and having one or more openings therein; and

a conformal light-absorber layer having substantially uniform thickness overlying the tracking layer and the reflective layer in the openings in the tracking layer;

wherein the thicknesses of the absorber and tracking layers are so chosen that there are first regions of the optical recording medium which have a reflectivity which is less than the reflectivity of second regions of the optical recording medium at a certain wavelength.

4,547,877

SYSTEM FOR SWITCHING MULTIRATE DIGITIZED VOICE AND DATA

Harvey R. Lehman, Batavia, and Matthew F. Siana, Naperville, both of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 9, 1983, Ser. No. 502,617

Int. Cl.⁴ H04Q *11/04;* **H04J** *3/16*

U.S. Cl. 370—58 **30 Claims**

1. A time division multiplex switching system for switching multirate digitized byte-organized signals from source channels carried on input digital carrier lines to destination channels carried on output digital carrier lines, each of said source

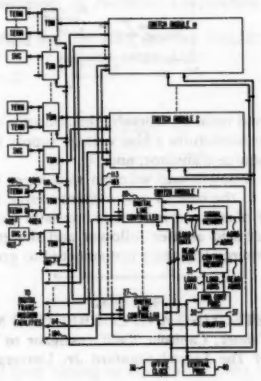
channels having a predetermined byte rate, each of said input digital carrier lines carrying a predetermined plurality of full-rate channels, comprising:

means for generating timing signals defining intervals for digital carrier timing;

means responsive to said timing signals for generating sequential address signals;

digital line controller (DLC) means responsive to said timing signals for assembling byte-organized input signals from said input digital carrier lines into DLC output signals and for distributing byte-organized DLC input signals to said output digital carrier lines;

means for determining an indication of the frame offset of signals for each of said source channels with respect to said timing signals;



processor means responsive to said frame offset indications for calculating signal memory addresses;

signal memory means having the capacity to store at least one byte of said byte-organized signals for each source channel for an interval of time defined by the byte rate of the source channel;

control memory means for storing at least one of said calculated signal memory addresses for each source channel in said input digital carrier lines and for generating signal memory addressing signals;

said signal memory means being responsive to said signal memory addressing signals and to said sequential address signals to store successive bytes of said DLC output signals and to generate successive bytes of said DLC input signals.

4,547,878

NON-LINEAR ADDER

Michael J. Hanley, Hickory Hills, Ill., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 28, 1983, Ser. No. 508,703

Int. Cl.[4] H04Q *11/04*

U.S. Cl. 370—62 **2 Claims**

1. A non-linear adder circuit for teleconferencing comprising:

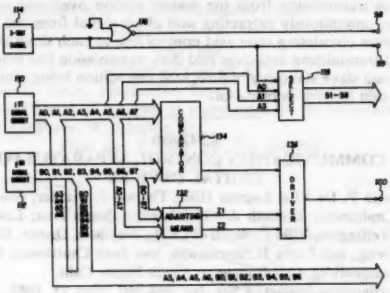
means for providing a first PCM signal having a pre-determined number of bits;

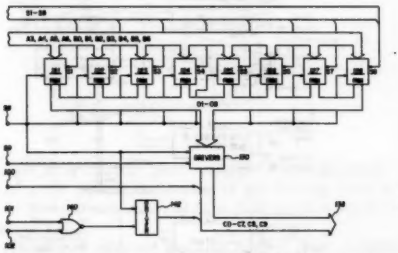
means for providing a second PCM signal having a predetermined number of bits:

means for providing a conferencing signal;

means for selecting which receives a first selected number of most significant bits of said first PCM signal and outputs a select signal;

plurality of programmable read only memory (PROM) circuits which receive as a 12-bit binary input, the 4th through 7th MSB of the first PCM signal, the 7th MSB of the second PCM signal, said select signal, and said conference signal, said PCM signals thereby identifying a unique address location within said PROMs; and





means for outputting a third PCM signal from said address location within said PROMs, said third PCM signal having a predetermined correspondence with said first and second PCM signals.

4,547,879

DIGITAL DATA TRANSMISSION PROCESS AND INSTALLATION

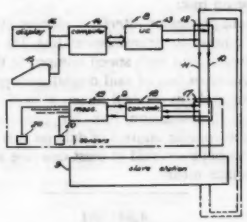
Jean-Francois Hamelin, Chatou, and Michel Combe, Rueil-Malmaison, both of France, assignors to Service National Electricite de France, Paris, France

Filed Nov. 3, 1983, Ser. No. 548,502

Claims priority, application France, Nov. 3, 1982, 82 18425

Int. Cl.[4] H04J *3/00, 3/02*

U.S. Cl. 370—86 **9 Claims**



1. A process for synchronous transmission of digital data over a network connecting a master station and a plurality of slave stations and comprising a data transmission line and a control and synchronizing line having the same configuration, said process comprising the steps of: transmitting control information suitable for extraction of a clock signal from the master

station over the control line and sending characters suitable for extraction of a clock signal throughout the time separating messages of said control information, whereby there is continuous transmission from the master station over said control line; continuously extracting said clock signal from the information circulating over said control line at each slave station; and transmitting data over said data transmission line from one of said slave stations at a time, said one station being identified by said control information.

4,547,880

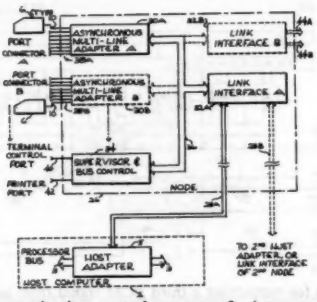
COMMUNICATION CONTROL APPARATUS FOR DIGITAL DEVICES

Joseph P. De Vita, Laguna Hills; Thomas J. Mulder, San Juan Capistrano; Kenneth J. O'Mohundro, Santa Ana; Leslie J. Wellington, Villa Park, all of Calif.; Wayne R. Deeter, Elkton, Oreg., and Larry D. Sternaman, San Juan Capistrano, Calif., assignors to Able Computer, Costa Mesa, Calif.

Continuation-in-part of Ser. No. 494,340, May 13, 1983,. This application Nov. 14, 1983, Ser. No. 551,292

Int. Cl.[4] H04Q *11/04*; H04J *3/00*

U.S. Cl. 370—91 **15 Claims**



1. A communication control apparatus for interconnecting a plurality of digital devices in a digital data communication network, comprising:

a local communication bus for routing of digital data and control signals internally of said control apparatus;

at least one digital data line adapter for transreceiving digital data on a corresponding line port coupled to a respective user digital device;

means in said adapter for selectively applying said digital data to said local communication bus;

a high speed data composite transmission link for transreceiving data between said control apparatus and a remote digital data processor;

a link interface means at the local end of said composite transmission link for providing a communication path between said local communication bus and said composite transmission link;

a digital data processor interface adapter at the remote end of said composite transmission link for communicating data between said high speed composite transmission link and a processor bus of said digital data processor; and

a supervisor and bus control means at said local end of said composite transmission link for providing source and destination routing control of data on said local communication bus between said at least one line adapter and said link interface means.

4,547,881

ECL LOGIC CIRCUIT WITH A CIRCUIT FOR DYNAMICALLY SWITCHABLE LOW DROP CURRENT SOURCE

Hemmige D. Varadarajan, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 9, 1983, Ser. No. 550,529

Int. Cl.[4] H03K *19/086*

U.S. Cl. 307—296 R **16 Claims**

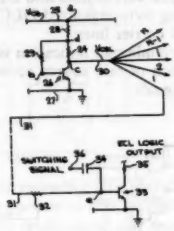
1. An ECL circuit comprising:

a bipolar transistor having means for coupling its emitter to a low potential which is less than a reference supply potential, V_{CS};

a first resistor coupled to said reference supply voltage V_{CS};

a second resistor coupled between said first resistor and the collector of said bipolar transistor;

a third resistor coupled between the base of said bipolar transistor and the interconnection between said first and



said second resistors whereby the collector of said bipolar transistor constitutes a bias voltage supply line, V_{CSL};

a current source transistor; and

an emitter follower and wherein said V_{CSL} supply line is coupled to the base of said current source transistor, the collector of said current source transistor is coupled to the emitter of said emitter follower and the emitter of said current source transistor is connected to ground.

4,547,882

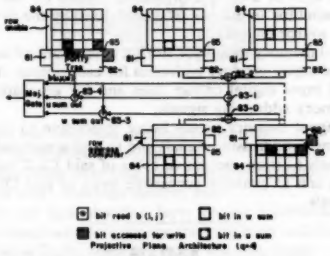
ERROR DETECTING AND CORRECTING MEMORIES

Robert M. Tanner, Capitola, Calif., assignor to The Board of Trustees of The Leland Stanford Jr. University, Stanford, Calif.

Filed Mar. 1, 1983, Ser. No. 470,910

Int. Cl.[4] G06F *11/10*

U.S. Cl. 371—38 **36 Claims**



1. A system for detecting and correcting errors in binary data bits comprising;

a digital memory including a first set of addressable storage locations for storing information bits and a second set of additional addressable storage locations for storing redundant check bits, said memory having an architecture defined by a code characterized by a bipartite graph, said graph having a minimum cycle length greater than or equal to six;

means for generating said redundant check bits from information bits stored in said first set of addressable storage locations, said redundant check bits being chosen to satisfy explicit check equations;

means for placing the check bits so generated in said second set of additional storage locations;

means for generating for each bit b stored in said first set or in said second set of addressable storage locations, a first, a second, and a third value,

said first value being the bit b itself,

said second value being the sum modulo 2 of the bits at depth 2 of the graph in the tree form of the code having the bit

b at the top of the tree which bits at depth 2 are checked by the node at depth 1 on the left side of said tree graph, and

said third value being the sum modulo 2 of the bits at depth 2 of the tree graph of the code having the bit b at the top of the tree which bits at depth 2 are checked by the node at depth 1 on the right side of said graph in tree form; and

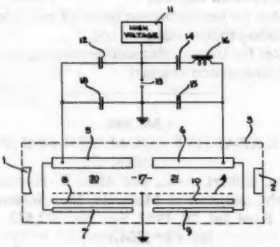
means for receiving said first, said second, and said third values and for producing a value called the delivered value of b by reading b as the majority vote of said first, said second and said third values.

4,547,883

LONG PULSE LASER WITH SEQUENTIAL EXCITATION

David B. Cohn, San Pedro, and Hiroshi Komine, Torrance, both of Calif., assignors to Northrop Corporation, Hawthorne, Calif.

Filed Sep. 16, 1983, Ser. No. 533,387
Int. Cl.⁴ H01S *3/10*
U.S. Cl. 372—25 **5 Claims**



1. A pulsed laser having an elongated cavity comprising:

a laser gain medium gas;

first excitation means for exciting a first portion of the gain medium gas during a first time interval so that the laser produces an optical output pulse in response to said excitation, said first excitation means including a pair of electrodes positioned adjacent said first portion of the gain medium of the elongated cavity, to excite the gain medium gas within said portion by means of an electric discharge through said portion of said gain medium gas;

second excitation means for exciting a second portion of the gain medium gas during a second time interval which begins subsequent to the beginning of said first time interval and which ends subsequent to the end of said first time interval, said second excitation means, including a pair of electrodes positioned adjacent said second portion of the gain medium of the elongated cavity, to excite the gain medium gas within said portion by means of an electric discharge through said portion of the gain medium gas;

a voltage source for supplying a voltage between a voltage source output terminal and a common terminal, the common terminal being connected to one of the electrodes of the first excitation means and to a corresponding one of the electrode(s) of the second excitation means;

a high voltage switch connected between the voltage source output terminal and the common terminal;

a first capacitor connected between the voltage source output terminal and the other electrode of the first excitation means;

a second capacitor connected between the common terminal and said other electrode of the first excitation means;

a saturable inductor and a third capacitor connected in series to form a series circuit, the series circuit being connected between the voltage source output terminal and the other electrode of the second excitation means; and

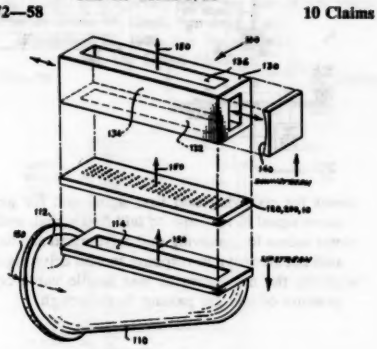
a fourth capacitor connected between the common terminal and said other electrode of the second excitation means, whereby the optical output pulse in response to excitation by the second excitation means begins at a time interval prior to the end of the optical output pulse produced in response to the excitation by the first excitation means.

4,547,884

SONIC FLOW PLATE

Nelson E. Jones, Huntington Beach, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 8, 1982, Ser. No. 366,743
Int. Cl.⁴ H01S *3/22*
U.S. Cl. 372—58 **10 Claims**



1. A gas flow control plate assembly, through which a stream of gas is passed, said stream of gas flowing from upstream to downstream, said gas flow control plate assembly comprising:

a. a plurality of adjacent gas flow control plate portions, which are adjacent to each other and fitted together to form a single flow plate by being placed side by side in a flat plane, with each plate portion having a protrusion which fits into a complementary indentation on the plate portion adjacent to it, said complementary indentation having an interior shape approximately equalling the dimensions of said protrusion, said protrusion thereby connecting said adjacent plate portions so that they are fitted together, with each plate portion having parallel upstream and downstream surfaces, said upstream surface being in a position upstream in said stream of gas from said downstream surface, said parallel upstream and downstream surfaces having a plurality of passageways therethrough, said plurality of passageways conducting said stream of gas through said gas flow control plate assembly, such that each passageway is useable as a gas flow nozzle, each plate portion having a plurality of like transverse holes which are in alignment with the plurality of like transverse holes through the adjacent plate portions, whereby a plurality of sets of aligned holes results; and

b. a plurality of tension rods, with a different one of said tension rods disposed through one of said plurality of sets of aligned holes in said adjacent gas flow control plate portions, said tension rods receiving, integrating and reinforcing said gas flow control plate assembly by holding in place said plate portions so that single unified gas flow control plate is formed.

4,547,885

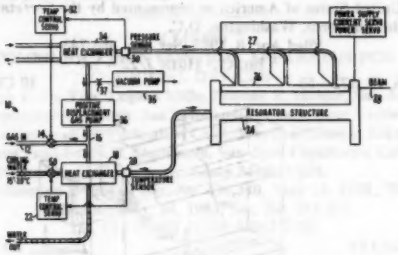
ACTIVE PRESSURE REGULATOR FOR A GAS LASER

Peter N. Allen, Los Altos Hills, and William Blake, Palo Alto, both of Calif., assignors to Coherent, Inc., Palo Alto, Calif.

Filed May 6, 1983, Ser. No. 492,501
Int. Cl.⁴ H01S *3/22*
U.S. Cl. 372—58 **4 Claims**

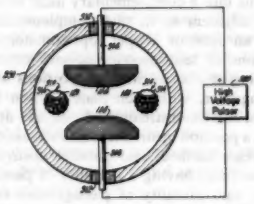
1. A pressure regulating system for controlling the pressure of a gas lasing medium in a gas laser; said system comprising:

a flow tube means for receiving said gas and for flowing said gas therethrough;
a movable needle valve in said flow tube means that controls the pressure of said gas flowing therethrough;
pressure sensing means for measuring the pressure of sid gas in said tube and for generating a first voltage signal which monotonically increases in response to said gas pressure;



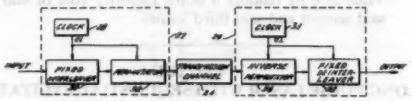
means for receiving said first signal and for generating a drive signal in response to said first signal; and
motor means for receiving said drive signal and for actuating said needle valve in response to said drive signal;
whereby the movement of said needle valve controls the pressure of said gas passing therethrough.

4,547,886
CATALYZED SEALED-OFF CO_2 LASER
Walter R. Kaminski, North Palm Beach, and Stanley J. Scalise, Palm Springs, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.
Continuation-in-part of Ser. No. 306,117, Sep. 25, 1981, abandoned. This application Jun. 27, 1983, Ser. No. 507,902
Int. Cl.[4] H01S *3/22*
U.S. Cl. 372—59 **2 Claims**



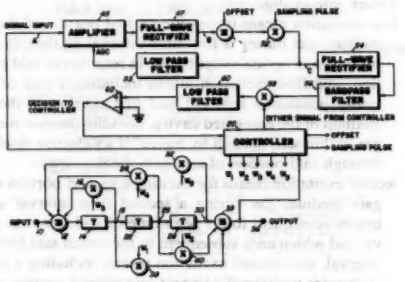
1. A pulsed CO_2 laser comprising
a lasing medium enclosed within a laser enclosure;
pulsed pumping means for exciting said lasing medium through an electric discharge in a discharge region in said lasing medium; and
means for resonating optical radiation in a portion of said discharge region in said lasing medium;
characterized in that said laser includes at least one catalyst holder disposed within said laser enclosure outside of said discharge region,
said catalyst holder having an interior portion containing a catalyst loosely disposed therein and a plurality of apertures providing a direct communicating path for said lasing medium between said interior portion of said catalyst holder and said discharge region; and
a predetermined quantity of particulate catalyst loosely disposed within said interior portion, whereby at least a portion of said particulate catalyst may move in response to said pulsed pumping means.

4,547,887
PSEUDO-RANDOM CONVOLUTIONAL INTERLEAVING
Shou Y. Mui, Carlisle, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Nov. 30, 1983, Ser. No. 556,661
Int. Cl.[4] G06F *11/10*
U.S. Cl. 375—1 **14 Claims**



7. Apparatus for interleaving a digital signal to be transmitted over a transmission channel, said apparatus comprising:
an interleaver for interleaving the order of the stream of bits in a non-random manner;
a permutator for permuting the order of said interleaved bits in a pseudo-random manner; and
a transmitter for transmitting said permuted, interleaved bits over a transmission channel.

4,547,888
RECURSIVE ADAPTIVE EQUALIZER FOR SMSK DATA LINKS
Carl R. Ryan, Gilbert, Ariz., and Allan R. Hambley, Atlantic Mine, Mich., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Jul. 28, 1982, Ser. No. 402,513
Int. Cl.[4] H04B *3/18*
U.S. Cl. 375—14 **13 Claims**



11. A method of adjusting PSK signals to reduce intersymbol interference comprising the steps of:
receiving the PSK signal to be adjusted, mixing the received PSK signals with feedback signals, delaying the mixed signals to produce intermediate PSK signals and feeding a portion of the intermediate PSK signals back to use in the mixing step as the feedback signals;
delaying the intermediate PSK signals, feeding a portion of the intermediate PSK signals forward and mixing the delayed intermediate PSK signals with the fed-forward portion of the intermediate PSK signals to produce adjusted PSK signals;
determining the presence of intersymbol interference in the adjusted PSK signals including the steps of periodically testing the output signal for intersymbol interference by automatically controlling the gain of the output signal, full wave rectifying the gain controlled output signal, periodically sampling the full wave rectified signal, and full wave rectifying the periodic samples to provide a signal having an average value which is a measure of the amount of intersymbol interference; and

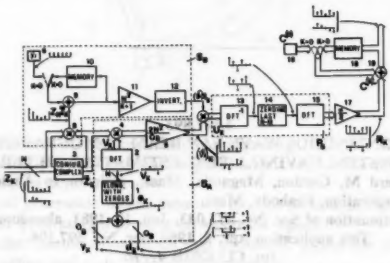
adjusting the portion of the intermediate PSK signals fed-back and the portion of the intermediate PSK signals fed-forward until intersymbol interference is substantially reduced in the adjusted PSK signals.

4,547,889

AUTO-ORTHOGONALIZING SYSTEM OF EQUALIZATION ADAPTED TO A RANGE OF DISCRETE FREQUENCIES AND EQUALIZER WHICH ACTIVATES THE SYSTEM

Giorgio Picchi, Sarzana, and Giancarlo Prati, Pisa, both of Italy, assignors to Consiglio Nazionale Delle Ricerche, Rome, Italy

Filed Jun. 10, 1983, Ser. No. 503,357
Claims priority, application Italy, Jun. 11, 1982, 84124 A/82
Int. Cl.⁴ H04B *1/10*
U.S. Cl. 375—15 **6 Claims**



1. An adaptive auto-orthogonalizing equalizer operating in the discrete frequency domain, comprising:

a filter with N cells operating in the discrete frequency domain by the overlap-save method, giving at its output a sequence of filtered samples;

a decision element, which is serially connected to said filter, to receive the sequence of filtered samples and to assign each of them to the nearest level out of a predetermined levels set (decision);

a control circuit, which is connected to said filter and to the output of said decision element and at each iteration, corresponding to the successive reception of input data blocks, to receive the discrete Fourier transform of an input sample vector, said filtered sample sequence and a decided symbol sequence, and uses them in order to vary the gains of said filter cells;

characterized in that said control circuit comprises:

a first estimator (S_A) having its input connected to said filter and to the output of said decision element, and having its output connected to the output of a second estimator (S_B) and to the input of a projector (P_S), said first estimator (S_A) estimating a vector $(\hat{\nabla}\epsilon)_k$ which is proportional to the gradient of the mean square value of the difference between the samples at the filter output and the corresponding decided symbols (mean square error);

a second estimator (S_B) having the input connected to the filter and its output connected to the output of said first estimator (S_A) and to the input of said projector (P_S), said second estimator (S_B) estimating a matrix $(\hat{\phi}\phi^H)_k$ by which to multiply the output vector from said first estimator (S_A) in order to transform it into another vector of which the direction passes as close as possible to the point corresponding to the absolute minimum of the function of the cell gain vector C, which represents the mean square error if C is the discrete Fourier transform of a real vector with N−M final zeroes, M being the number of cells of the filter operating in the time domain and equivalent to the filter under examination; and

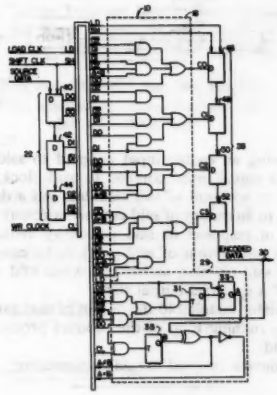
a projector (P_S) having its input connected with the outputs of said first and second estimators (S_A, S_B) and having its output connected to a circuit for adjusting the cell gain vector (C^k), said projector (P_S) receiving as input the vector (U_k) represented by the product of the matrix $(\hat{\phi}\phi^H)_k$ and the vector $(\hat{\nabla}\epsilon)_k$ and providing as output a vector which is the transform of a real vector with N−M final zeroes, and a circuit for adjusting the cell gain vector (C^k), which subtracts from said vector (C^k) a vector (R_k) proportional to the output vector from said projector (P_S).

4,547,890

APPARATUS AND METHOD FOR FORMING D.C. FREE CODES

Abraham M. Gindi, 1778 Curtner Ave., San Jose, Calif. 95124, assignor to Abraham M. Gindi, San Jose, Calif.

Filed Sep. 28, 1982, Ser. No. 424,938
Int. Cl.⁴ H03K *13/02*
U.S. Cl. 375—19 **21 Claims**



1. An apparatus for encoding sequentially a plurality of input binary data digital signals of a source code into output binary data digital signals forming words according to encoding rules of a run-length-limited encoding set requiring d.c.-balanced message content, said apparatus comprising:

first data storage means for temporarily storing said input digital signals;

second data storage means for storing a digital charge value related to charge of at least one encoded word prior to a current encoded word; and

encoding logic means coupled to said first data storage means and to said second data storage means for encoding said input signals into said output signals within said run-length limited constraints wherein said encoding set has fewer code choices than is required in a closed set consisting of single code words having one-to-one conversion between said source code and said encoding set, and wherein said digital charge value is employed to modify said encoding rules for said current encoded word.

4,547,891

APPARATUS FOR MONITORING THE PERFORMANCE OF A PRESS OR LIKE MACHINE

Frank J. Avellino, Russell, and Robert R. Johnson, Ludlow, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Dec. 8, 1983, Ser. No. 559,541
Int. Cl.⁴ G07C *3/10*
U.S. Cl. 377—16 **2 Claims**

1. An apparatus for indicating the total amount of product produced by a press, said apparatus comprising:

stroke indicating means comprising a proximity switch sensi-

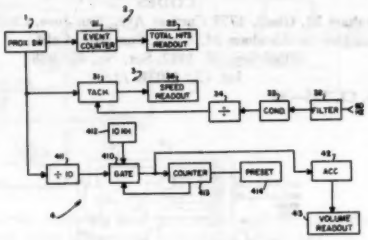
tive to the operation of said press so as to indicate the occurrence of a stroke of said press;

an N-pulser coupled to said stroke indicating means for providing at an output a digital signal related to the amount of product produced during a stroke of said press, said N-pulser comprising

a counter;

presetting means coupled to said counter for presetting said counter to a state determined by the amount of product produced as a result of each stroke of said press;

a clock;



a gate having an enable input coupled to said proximity switch, a signal input coupled to said clock, an output coupled to an input of said counter, and a disable input coupled to an output of said counter whereby said gate is opened in response to said proximity switch, thereby allowing said output of said clock to be coupled to the input of said counter, and closed when said counter has achieved a specified output state;

an accumulator coupled to the output of said gate for maintaining a running total of the product produced by said press; and

a readout device coupled to said accumulator.

4,547,892

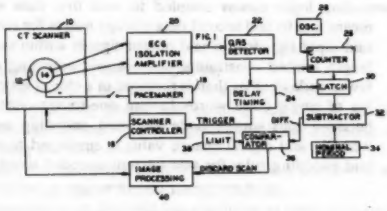
CARDIAC IMAGING WITH CT SCANNER

Joseph B. Richey, Shaker Heights; Robert H. Wake, Warrensville Heights; Ronald G. Walters, Aurora; Willard F. Hunt, Cleveland, and Steven L. Cool, Shaker Heights, all of Ohio, assignors to Technicare Corporation, Solon, Ohio

Continuation of Ser. No. 783,717, Apr. 1, 1977, abandoned. This application Dec. 26, 1979, Ser. No. 106,730

Int. Cl.⁴ A61B *5/02, 6/00;* **H05G** *1/44*

U.S. Cl. 378—8 **13 Claims**



1. A radiographic apparatus for imaging a planar slice of a patient's heart, the apparatus comprising:

a CT scanner comprising a source of at least one beam of radiation, scan means for scanning the beam of radiation relative to the heart substantially in the plane of the slice, data generating means for generating image data from detected radiation which has crossed through the scan circle, means for processing image data from the data generating means to reconstruct a tomographic image of the planar slice;

cardiac cycle monitoring means for producing a repeating pulse signal indicative of the same functional point in each successive cardiac cycle of the patient;

control means responsive to said pulse signal for causing said processing means to process image data generated during the same selectable phase in successive cardiac cycles, said control means including selectable delay means for delaying said pulse signal for a selectable duration thereby selecting said selectable phase in the cardiac cycle; and,

irregular cardiac cycle sensing means comprising discriminator means responsive to said pulse signal for producing an output signal to command said processing means to discard image data when the corresponding cardiac period varies from the patient's nominal cardiac period beyond predetermined limits, whereby data from irregular cardiac cycles is prevented from degrading the tomographic image.

4,547,893

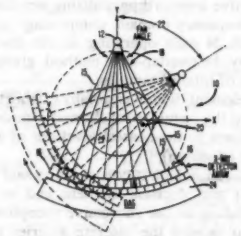
CONTINUOUS WAVE FAN BEAM TOMOGRAPHY SYSTEM HAVING A BEST-ESTIMATING FILTER

Bernard M. Gordon, Magnolia, Mass., assignor to Analogic Corporation, Peabody, Mass.

Continuation of Ser. No. 273,033, Jun. 12, 1981, abandoned. This application Apr. 5, 1984, Ser. No. 597,196

Int. Cl.⁴ G03B *41/16*

U.S. Cl. 378—19 **5 Claims**



1. A method of forming a tomographic image comprising the steps of:

exposing a subject to a beam of x-ray photons from an x-ray source along a path;

continuously moving said path through a subject;

receiving said beam of x-ray photons substantially continuously including a first set of discrete points in time, on an array of detectors disposed opposite said x-ray source;

filtering the output of each said detector by filter means allowing a maximum useable frequency to pass and rejecting error signals containing a noise signal therein above said maximum useable frequency, the maximum useable frequency being defined by the internal structure of the subject and by the relative motion of said beam of x-ray photons;

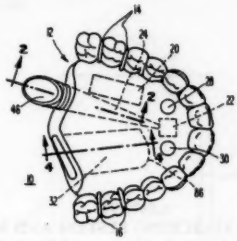
instantaneously sampling the output of each said filter means at a respective second set of discrete points in time which are substantially different from said first set of discrete points; and

reconstructing an image from the sampled output including deriving a signal for each said filter means for each of said discrete points in time of said first set, said derived signals being representative of the x-ray photons received by the respective detectors at said first set of discrete points in time.

4,547,894
REPLACEABLE BATTERY PACK FOR INTRA-ORAL LARYNX

Jon M. Benson, Jacksonville, and Craig A. Castle, Ponte Vedra Beach, both of Fla., assignors to Xomed, Inc., Jacksonville, Fla.

Filed Nov. 1, 1983, Ser. No. 547,753
Int. Cl.⁴ A61F *1/20*
U.S. Cl. 381—70 **20 Claims**

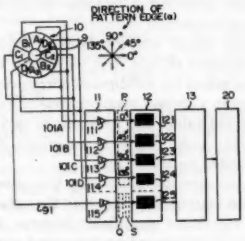


1. An intra-oral artificial larynx comprising:
prosthetic means for mounting said larynx within the intra-oral cavity;
signal generation means mounted on said prosthetic means for generating a preselected electrical signal;
speaker means mounted on said prosthetic means for converting said signal into acoustic energy;
a tongue activatable switch for enabling said signal generation means and said speaker means;
a compartment for slideably receiving a power source, said compartment having a lip around the opening thereto; and
a power source mounted on a carrier, said carrier being slideably and removably mounted in said compartment, said carrier including an integral sealing portion mating with said lip for isolating the interior of said compartment and said power source from saliva in the intra-oral cavity.

4,547,895
PATTERN INSPECTION SYSTEM

Kikuo Mita, Yokohama; Masayuki Oyama, Hino; Takashi Yoshida, Kawasaki; Masato Nakashima, Yokohama; Katsumi Fujihara, Sagamihara, and Tadao Nakakuki, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 197,345, filed as PCT JP79/00271, Oct. 25, 1979, published as WO 80/01002, May 15, 1980, § 102(e) date Jun. 23, 1980, Pat. No. 4,392,120. This application Sep. 30, 1982, Ser. No. 428,605
Claims priority, application Japan, Oct. 30, 1978, 53-133610; Nov. 13, 1978, 53-155946; Nov. 28, 1978, 53-146865; Nov. 28, 1978, 53-146870
Int. Cl.⁴ G06K *9/00*
U.S. Cl. 382—8 **17 Claims**

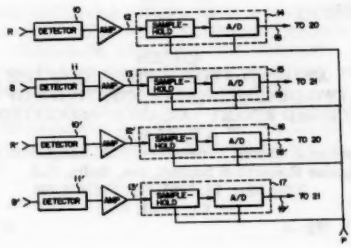


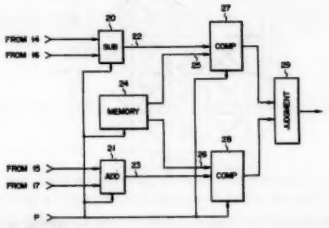
14. A pattern inspection system, comprising:
a bidimensional register which stores image pattern data;
an inspection mask formed on said bidimensional register; and
an inspection circuit which extracts the signal for inspection from said register, said inspection mask being adapted to check the stored image pattern data in said register, wherein said inspection mask provides a first inspection mask which detects pattern edge points in vertical and horizontal directions for said stored image pattern data and pinholes after the inversion between light transmission and light interruption, respectively, and a second inspection mask which detects pattern edge points in a diagonal direction for said stored image pattern data and pinholes after inversion.

4,547,896
PRINTED MATTER IDENTIFYING APPARATUS

Ko Ohtombe, Tokyo; Tsuyoshi Ishida; Hideo Osawa, both of Yokohama, and Kenji Nagahashi, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 28, 1982, Ser. No. 392,476
Claims priority, application Japan, Jun. 29, 1981, 56-99618
Int. Cl.⁴ G06K *9/26*
U.S. Cl. 382—7 **15 Claims**





1. A method for identifying printed matter comprising the steps of:
conveying printed matter having a pattern through a lighted conveying path in a predetermined direction;
filtering light-waves transmitted from at least two sections of said printed matter, said sections divided from each other in a direction substantially orthogonal to said predetermined direction of conveyance;
photoelectrically converting said filtered light-waves from each said section to produce at least first and second electric signals;
combining said first and second electric signals in a first manner to produce a first operating signal;
combining said first and second electric signals in a second manner, which differs from said first manner, to produce a second operating signal;
comparing said first and second operating signals with first

and second reference signals obtained from a reference pattern; and

judging whether said pattern of said conveyed printed matter is equivalent to said reference pattern from the results of said comparing step.

4,547,897

IMAGE PROCESSING FOR PART INSPECTION

Russell H. Peterson, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 1, 1983, Ser. No. 462,744
Int. Cl.[4] H04N 9/04; G06K 9/46
U.S. Cl. 382—8 **7 Claims**

1. The method of inspecting a manufactured item to determine a selected characteristic thereof comprising the steps of:

viewing an item with a color television camera to produce a video signal;

selecting a predetermined color with a chromakeyer connected to the camera to receive the video signal and to produce a modified signal wherein the selected color is highlighted;

assigning gray scale values based on hue to individual portions of the modified signal so that the highlighted portions receive higher gray scale values; and

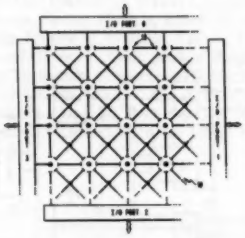
comparing the higher gray scale values with predetermined values to determine the selected characteristic when a match occurs.

4,547,898

APPARATUS FOR DETERMINING THE TWO-DIMENSIONAL CONNECTIVITY OF A PRESCRIBED BINARY VARIABLE ASSOCIATED WITH A SURFACE

Constantine J. Tsikos, Pennsauken, N.J., assignor to Siemens Corporate Research & Support, Inc., Iselin, N.J.

Filed Mar. 11, 1983, Ser. No. 474,408
Int. Cl.[4] G06K 9/28
U.S. Cl. 382—4 **17 Claims**



1. Apparatus for determining the two-dimensional connectivity of a prescribed binary variable associated with a surface between remote points on said surface, said apparatus comprising in combination:

(a) a single two-dimensional array of spatially located circuit nodes all located in one plane;

(b) a plurality of circuit switches, each switch being conductively connected between at least two adjacent nodes and being operative to pass an unimpeded signal between said adjacent nodes when in a closed position and to block the passage of a signal between said adjacent nodes when in an open position;

(c) a two-dimensional array of binary sensors, each sensor having a single spatial output and means for sensing the binary state of said variable at a respective point on said surface; and

(d) means, connected to said sensors, for directly controlling the individual positions of said circuit switches in response to the individual states of said variable as sensed by respective ones of said sensors,

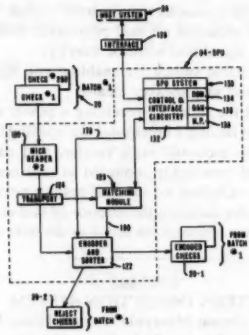
each sensor being associated with a corresponding spatially located node in the respective array and two adjacent nodes are connected together by said switches whenever a given state of said variable is sensed by the sensors associated with said two adjacent nodes.

4,547,899

WAVEFORM MATCHING SYSTEM AND METHOD

Robert B. Nally; James F. Akister, and Hung S. Ma, all of Waterloo, Canada, assignors to NCR Corporation, Dayton, Ohio

Filed Sep. 30, 1982, Ser. No. 431,923
Int. Cl.[4] G06K 9/62
U.S. Cl. 382—7 **29 Claims**



1. A method of matching first magnetic waveforms and second magnetic waveforms, each having identifiable features used for identification purposes, comprising the steps of:

(a) obtaining from each said first magnetic waveform those of said identifiable features which are significant, with significant meaning those identifiable features providing the largest recognition distances as used in "matching template" character recognition; said significant identifiable features having values and locations with respect to a starting point of the associated said first waveform, with said significant identifiable features being obtained according to predetermined criteria;

(b) utilizing said values and locations of said significant identifiable features of said first waveform to search in anticipated locations for anticipated corresponding identifiable features in a second magnetic waveform;

(c) determining the values and locations of said identifiable features of said second magnetic waveform, if any, found in said anticipated locations; and

(d) comparing via comparing circuitry the values and locations from said determining step with the values and locations of said significant identifiable features of a said first magnetic waveform according to second predetermined criteria to determine whether or not the second magnetic waveform matches a said first magnetic waveform.

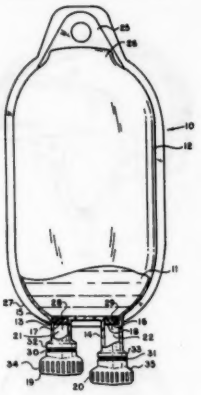
4,547,900
FLEXIBLE CONTAINER WITH INTEGRAL PORTS AND DIAPHRAGM

Mark E. Larkin, Lindenhurst, and Leonard J. Meyer, Antioch, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 106,954, Dec. 26, 1979, Pat. No. 4,313,904. This application Sep. 12, 1980, Ser. No. 186,782

Int. Cl.⁴ B65D *41/32*

U.S. Cl. 383—5 **13 Claims**



1. A container having a quantity of liquid therein comprising:

a hollow body formed of a plastic material;

at least one tubular port integrally formed in and extending from said hollow body; each said port having a quantity of said plastic material integrally formed as a diaphragm within said port so as to seal said port;

a resealable septum member fixedly attached and sealed within at least one said tubular port, said diaphragm being positioned between said resealable septum and said liquid so as to prevent deterioration of said resealable septum from exposure to said liquid; said resealable septum and said diaphragm being adapted for penetration by a hypodermic needle;

a removable twist cap member integrally formed about and sealing the end of at least one said tubular port; and

frangible groove means circumscribing said tubular port for facilitating the separation and removal of said twist cap member from said tubular port.

4,547,901
MICROWAVE RECEIVING APPARATUS USING A WAVEGUIDE FILTER

Toshio Shibata, Yokohama, and Koichiro Sakuma, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 17, 1983, Ser. No. 552,838

Claims priority, application Japan, Nov. 30, 1982, 57-208461

Int. Cl.⁴ H04B *1/10, 1/26*

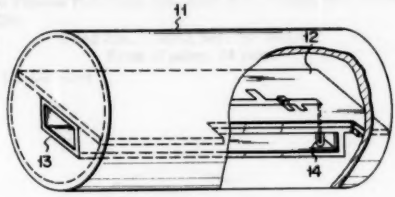
U.S. Cl. 455—300 **4 Claims**

1. A microwave signal receiving apparatus comprising:

a wave guide filter for receiving a microwave signal by an input section and suppressing an image frequency signal component in the microwave signal, said wave guide filter having such a dimension that its cut-off frequency is higher than an image frequency and lower than a desired microwave signal frequency;

a receiving circuit board on which a receiving circuit for amplifying an output signal of said wave guide filter and then converting it to an intermediate frequency signal is arranged; and

a shield case for housing said wave guide filter and said receiving circuit board, said shield case being sealed at



both ends thereof except said input section of said wave guide filter, said wave guide filter and said receiving circuit board being positioned one on top of the other in said shield case in a direction perpendicular to the ends of said shield case.

4,547,902
RADIO RECEIVER COMPRISING A FREQUENCY LOCKED LOOP WITH AUDIO FREQUENCY FEEDBACK, AND A MUTING CIRCUIT

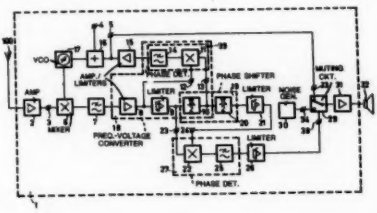
Wolfdietrich G. Kasperkovitz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 183,553, Sep. 2, 1980, Pat. No. 4,426,735. This application Aug. 10, 1983, Ser. No. 521,813

Claims priority, application Netherlands, Sep. 4, 1979, 7906602

Int. Cl.⁴ H04B *1/14, 1/26*

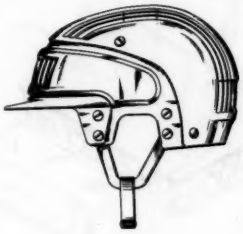
U.S. Cl. 455—194 **2 Claims**

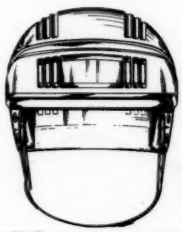


1. A radio receiver having a frequency-locked loop, said loop including a voltage-controlled oscillator having an input for a tuning voltage, a mixer stage coupled to the voltage-controlled oscillator and connected to an aerial input, a filtering element coupled between the mixer stage and a frequency-voltage converter, said converter coupled to the tuning voltage input of the voltage controlled oscillator, the receiver further having a muting circuit coupled to said frequency-voltage converter for blocking the feeding of an audio signal to an audio signal processing section of the receiver unless the receiver is substantially correctly tuned to a broadcast transmission, said muting circuit receiving a correct tuning signal from a correct tuning detector coupled to said frequency-locked loop, characterized in that an input of the muting circuit is coupled to a noise source circuit for applying a noise signal in place of said audio signal through said muting circuit to said audio signal processing section in the absence of a correct tuning signal of the muting circuit.

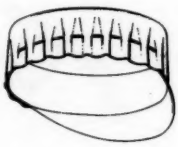
OCTOBER 15, 1985

280,945
HELMET
Andrew J. Foulkes, Beaumaris, Australia, assignor to Rosebank Plastics Pty. Ltd., Dandenong, Australia
Filed Jan. 14, 1983, Ser. No. 458,065
Claims priority, application Australia, Jul. 29, 1982, 1075/82
Term of patent 14 years
U.S. Cl. D2—232



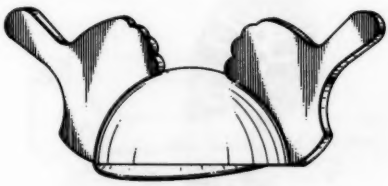


280,946
HAT
Charles G. Rutyna, 3109 Ocean Front Walk, Marina Del Rey, and Thomas P. O'Shea, 24C Rose Ave., Venice, both of Calif. 90291
Filed Sep. 30, 1982, Ser. No. 431,743
Term of patent 14 years
U.S. Cl. D2—248



280,947
HAT
Charles G. Rutyna, 3109 Ocean Front Walk, Marina Del Rey, and Thomas P. O'Shea, 24C Rose Ave., Venice, both of Calif. 90291
Filed Jan. 7, 1983, Ser. No. 435,059
Term of patent 14 years
U.S. Cl. D2—248

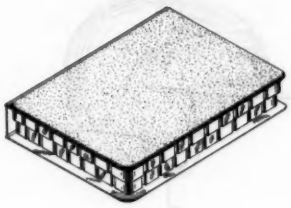
280,948
NOVELTY BEANIE
Dee A. Smith, Rte. 1, Box 91E, Palmer, Tex. 75152
Filed Aug. 4, 1983, Ser. No. 520,505
Term of patent 14 years
U.S. Cl. D2—248

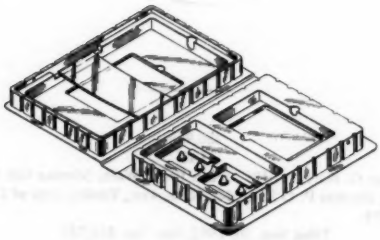


280,949
ATHLETIC SHOE WITH PADDED COUNTER
Robert J. Gamm, St. Louis County, Mo., assignor to Kangaroos U.S.A. Inc., St. Louis, Mo.
Filed Apr. 1, 1983, Ser. No. 481,167
Term of patent 14 years
U.S. Cl. D2—310

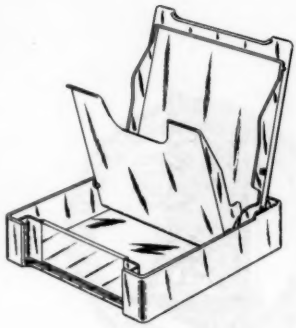
280,950
SHOE SOLE
Arnold S. Austin, East Brookfield, and David J. Hill, Paxton, both of Mass., assignors to Quabaug Rubber Company, North Brookfield, Mass.
Filed May 31, 1983, Ser. No. 499,528
Term of patent 14 years
U.S. Cl. D2—320

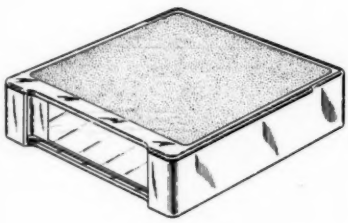
280,951
COMBINED AUDIO AND VIDEO CASSETTE TRANSPORT CONTAINER
Larry D. Holland, Plano, Tex., assignor to Neha International, Plano, Tex.
Filed Apr. 6, 1983, Ser. No. 482,606
Term of patent 14 years
U.S. Cl. D3—35



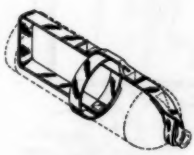


280,952
DISKETTE STORAGE CASE
Balthasar Kirchner, Eferding, Austria, assignor to Ernst Stadelmann Gesellschaft m.b.H., Eferding, Austria
Filed Dec. 2, 1983, Ser. No. 557,628
Term of patent 14 years
U.S. Cl. D3—35





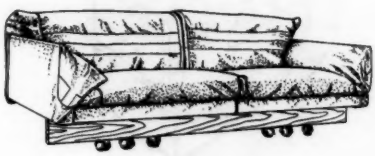
280,953
SCUBA TANK CARRIER
Stephen M. Paul, 3396 Yankee Doodle Rd., Eagan, Minn. 55121
Filed Mar. 31, 1983, Ser. No. 480,942
Term of patent 14 years
U.S. Cl. D3—36



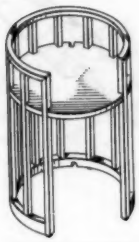
280,954
RETRACTABLE BRISTLE BRUSH
James M. Rittenhouse, Watchung, N.J., assignor to Conair Corporation, Edison, N.J.
Filed Jul. 7, 1983, Ser. No. 511,786
Term of patent 14 years
U.S. Cl. D4—128

280,955
COMBINED SOFA AND ADJUSTABLE LEGREST
Hans Hopfer, Paris, France, assignor to Alex Synn AG, Cham, Switzerland
Filed Dec. 28, 1982, Ser. No. 454,104
Claims priority, application Hague, Jun. 30, 1982, DM/001,596
Term of patent 14 years
U.S. Cl. D6—361

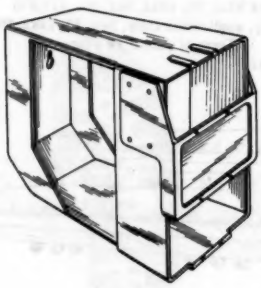
280,956
SOFA
Giovanni Offredi, Via Ludovico Muratori 29, Milano, Italy
Filed Mar. 10, 1983, Ser. No. 473,870
Claims priority, application Italy, Sep. 17, 1982, 60947/82[U]
Term of patent 14 years
U.S. Cl. D6—381



280,957
TELEPHONE STAND
Richard Meier, New York, N.Y., assignor to Knoll International, Inc., New York, N.Y.
Filed Sep. 15, 1982, Ser. No. 418,480
Term of patent 14 years
U.S. Cl. D6—455

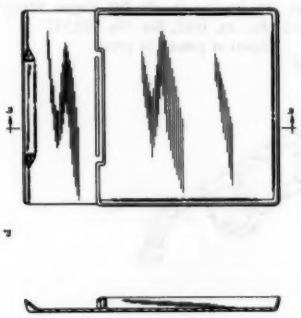


280,958
ATTACHMENT FOR A CIGARETTE RACK
William Silver, New York, N.Y., assignor to Thomson-Leeds Company, Inc., New York, N.Y.
Filed Aug. 30, 1982, Ser. No. 412,563
Term of patent 14 years
U.S. Cl. D6—517



280,959
DISPLAY UNIT
Robert K. Sperry, Newtown Square, Pa., assignor to Color Process Company, Inc., West Conshohocken, Pa.
Filed Sep. 15, 1983, Ser. No. 532,392
Term of patent 14 years
U.S. Cl. D6—517

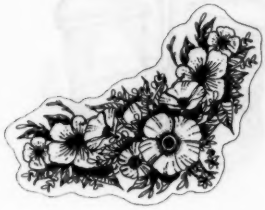
280,960
FOOD SERVICE TRAY
Malcolm J. Dodd, and Joseph A. Juhas, both of Litchfield, Conn., assignors to PTC Aerospace Inc., Bantam, Conn.
Filed Mar. 17, 1983, Ser. No. 476,178
Term of patent 14 years
U.S. Cl. D7—38



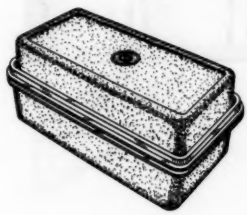
280,961
DECAL FOR A PLATE OR SIMILAR ARTICLE
Steve A. Unger, Manlius, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 23, 1983, Ser. No. 478,083
Term of patent 14 years
U.S. Cl. D7—39

280,962
DECAL FOR A PLATE OR SIMILAR ARTICLE
Steve A. Unger, Manlius, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 24, 1983, Ser. No. 478,637
Term of patent 14 years
U.S. Cl. D7—39

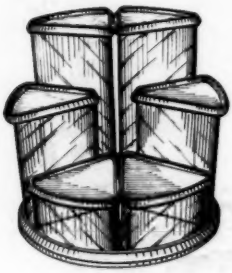
280,963
DECAL FOR A PLATE OR SIMILAR ARTICLE
Steve A. Unger, Manlius, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed Mar. 23, 1983, Ser. No. 478,085
Term of patent 14 years
U.S. Cl. D7—39



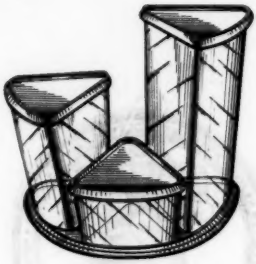
280,964
COVERED CONTAINER OR THE LIKE
Martin J. Wolff, North Providence, R.I., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Feb. 1, 1983, Ser. No. 462,827
Term of patent 14 years
U.S. Cl. D7—79

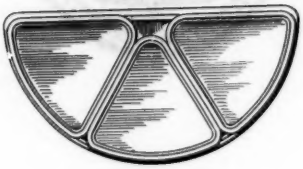


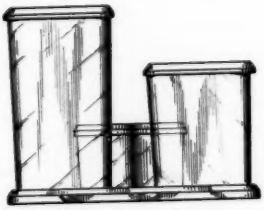
280,965
FOOD STORAGE SYSTEM
Wilson B. Prophet, Jr., South Norwalk; William G. Wolfe, Riverside, and Thomas J. Simmons, Weston, all of Conn., assignors to The Carousel Group, Inc., Weston, Conn.
Filed Aug. 20, 1982, Ser. No. 409,912
Term of patent 14 years
U.S. Cl. D7—81

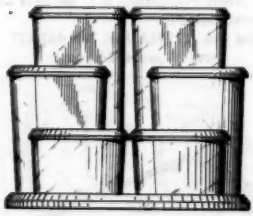


280,966
FOOD STORAGE SYSTEM
Wilson B. Prophet, Jr., South Norwalk; William G. Wolfe, Riverside, and Thomas J. Simmons, Weston, all of Conn., assignors to The Carousel Group, Inc., Weston, Conn.
Filed Aug. 20, 1982, Ser. No. 409,913
Term of patent 14 years
U.S. Cl. D7—81

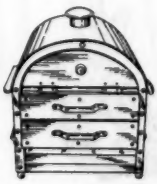




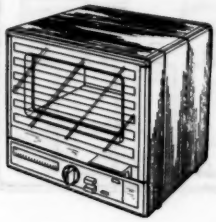




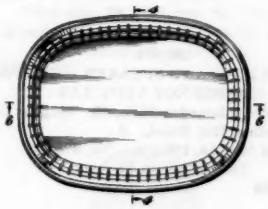
280,967
OVEN
Paul E. Wrighton, Rea Bridge Cottage, Nean Sollars, Nr. Kidderminster, Worcestershire, England
Filed Dec. 28, 1982, Ser. No. 454,091
Term of patent 14 years
U.S. Cl. D7—339



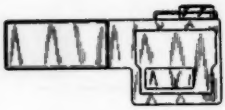
280,968
MICROWAVE OVEN
Bong H. Song, Seoul, Rep. of Korea, assignor to Gold Star Company, Ltd., Seoul, Rep. of Korea
Filed Aug. 29, 1983, Ser. No. 527,017
Claims priority, application Rep. of Korea, Jun. 21, 1983, 6645-83
Term of patent 14 years
U.S. Cl. D7—351



280,969
CASSEROLE
Franklin E. Schrage, Monroe, Conn., assignor to Union Carbide Corporation, Danbury, Conn.
Filed Apr. 7, 1983, Ser. No. 482,937
Term of patent 14 years
U.S. Cl. D7—354

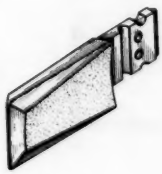


280,970
CAN-OPENER
Jan F. Van Asten, Leek, and Wilhelmus G. E. Janssens, Drachten, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Nov. 21, 1983, Ser. No. 554,138
Claims priority, application Benelux, Jun. 3, 1983, 57930-00
Term of patent 14 years
U.S. Cl. D8—36

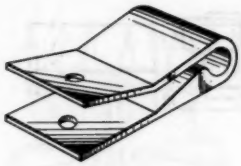


280,971
INJECTION HATCHET FOR TREATING DISEASED OR UNWANTED TREES
Michael Newton, 149 Peterson Rd., Philomath, Oreg. 97370
Filed Dec. 16, 1983, Ser. No. 562,299
Term of patent 14 years
U.S. Cl. D8—76

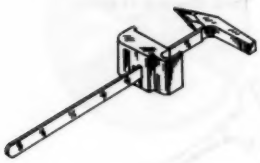
280,972
LATCH
Samuel S. Leotta, Jenkintown, Pa., assignor to Southco, Inc., Concordville, Pa.
Filed Jun. 13, 1983, Ser. No. 503,885
Term of patent 14 years
U.S. Cl. D8—331



280,973
GROUNDING WIRE CLAMP
David R. Ferrell, 4125 Townhouse Rd., Apt. K, Richmond, Va. 23228
Filed Aug. 17, 1983, Ser. No. 523,877
Term of patent 14 years
U.S. Cl. D8—395

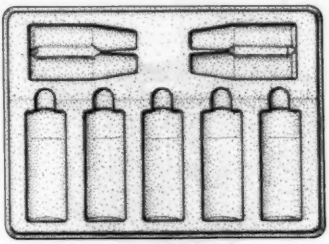


280,974
WALL BOARD CLAMP
Randolph R. Ruetsch, Green Brook, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.
Filed Apr. 1, 1982, Ser. No. 364,581
Term of patent 14 years
U.S. Cl. D8—396

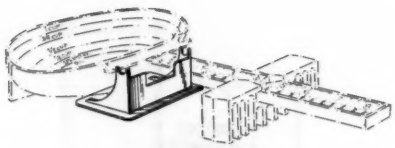


280,975
JAR
Robert G. Van Dine, 944 Indian Peak Rd., Rolling Hills, Calif. 90274
Filed Jan. 10, 1983, Ser. No. 456,708
Term of patent 14 years
U.S. Cl. D9—353

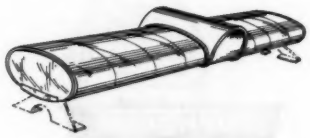
280,976
PACKAGING TRAY INSERT FOR A CONTAINER
Jeffrey H. Diamond, Palm Beach, Fla., assignor to J. H. Diamond Company, Lake Worth, Fla.
Filed Feb. 23, 1983, Ser. No. 469,058
Term of patent 14 years
U.S. Cl. D9—456



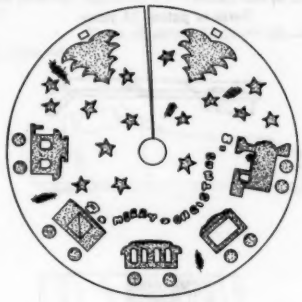
280,977
DIET SCALE PLATFORM
Charles W. H. Matthaei, Gig Harbor, Wash., assignor to Roman Meal Company, Tacoma, Wash.
Filed Feb. 22, 1983, Ser. No. 468,682
Term of patent 14 years
U.S. Cl. D10—94



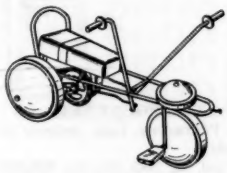
280,978
COMBINED LIGHT AND SPEAKER HOUSING FOR EMERGENCY VEHICLES
Earl W. Gosswiller, Clarendon Hills, Ill., assignor to Federal Signal Corporation, Oak Brook, Ill.
Filed May 16, 1983, Ser. No. 494,798
Term of patent 14 years
U.S. Cl. D10—114



280,979
CHRISTMAS TREE SKIRT WITH POCKETS
Cynthia L. Groth, 269 Parkside Ave., Buffalo, N.Y. 14214
Filed Oct. 20, 1983, Ser. No. 543,768
Term of patent 14 years
U.S. Cl. D11—130

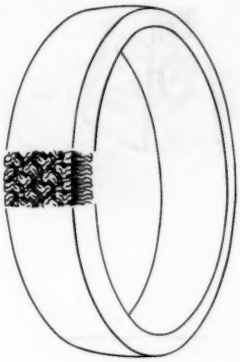


280,980
TRICYCLE
Myung K. Oh, San 2-9, Tuck Eun-ri, Shin Do-eup, Koyang-goon, Kyung Gi-do, and Myung S. Koo, 47-3, Namchang-dong, Chung-ku, Seoul, both of Rep. of Korea
Filed Sep. 28, 1983, Ser. No. 536,812
Term of patent 14 years
U.S. Cl. D12—112

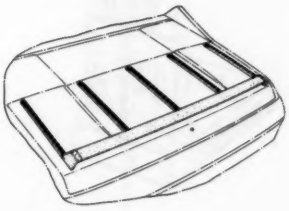


280,981
AUTOMOBILE TIRE
Katsubumi Ohta; Kazuyoshi Mineya, both of Hiratsuka, and Mituo Maeda, Hadano, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan
Filed Mar. 28, 1983, Ser. No. 479,312
Claims priority, application Japan, Sep. 28, 1982, 57-43748
Term of patent 14 years
U.S. Cl. D12—142

280,982
PNEUMATIC TIRE TREAD AND BUTTRESS
John A. Hutz, Orchard Lake, Mich., assignor to Uniroyal, Inc., Middlebury, Conn.
Filed Aug. 16, 1983, Ser. No. 523,804
Term of patent 14 years
U.S. Cl. D12—149



280,983
LUGGAGE CARRIER ASSEMBLY
John R. Schinella, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jun. 6, 1983, Ser. No. 501,528
Term of patent 14 years
U.S. Cl. D12—157



280,984

LOUDSPEAKER CABINET

Keith A. Tricker, The Mill, Alpheton, Sudbury, Suffolk C010 9BG, England

Filed Jan. 24, 1983, Ser. No. 460,265

Claims priority, application United Kingdom, Dec. 3, 1982, 1010103

Term of patent 14 years

U.S. Cl. D14—34

280,985

LOUDSPEAKER

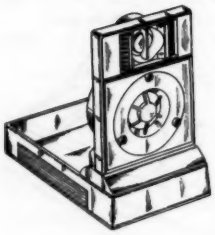
Gary E. Grimes, Watertown, Conn., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 27, 1983, Ser. No. 507,894

Claims priority, application Benelux, Jan. 4, 1983, 57465-01

Term of patent 14 years

U.S. Cl. D14—34



280,986

TELEPHONE HANDSET FOR MOBILE RADIO UNIT

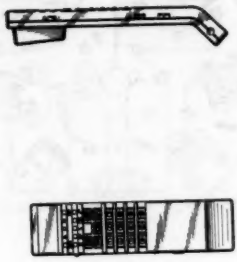
Tonis Kao, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 18, 1983, Ser. No. 476,576

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1982, MR Bd. 9, Nr. 13090

Term of patent 14 years

U.S. Cl. D14—53



280,987

TELEPHONE SET

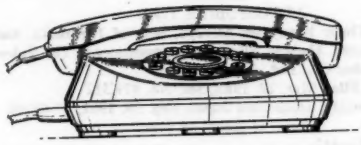
Bruno Todeschini, Pietrasanta, Italy, assignor to Telcer Telefonia, S.p.A., Italy

Filed Jul. 18, 1983, Ser. No. 515,039

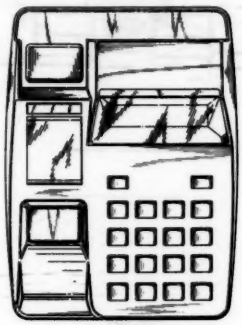
Claims priority, application Italy, Jan. 28, 1983, 20636B/83

Term of patent 14 years

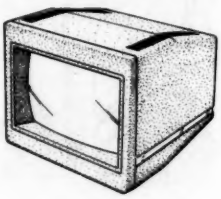
U.S. Cl. D14—53



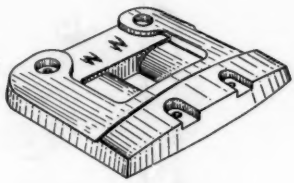
280,988
TELEPHONE HANDSET BASE INCLUDING TRANSPARENT DISPLAY PANELS
John K. Williams, Ipswich, England, assignor to British Telecommunications, London, England
Filed Sep. 24, 1982, Ser. No. 422,562
Claims priority, application United Kingdom, Mar. 29, 1982, 1005847
Term of patent 14 years
U.S. Cl. D14—62



280,989
CRT DISPLAY HOUSING
Michael Cridland, Manlius, N.Y., and David P. Moriconi, Ben Lomond, Calif., assignors to Victor Technologies, Inc., Scotts Valley, Calif.
Filed Nov. 15, 1982, Ser. No. 441,884
Term of patent 14 years
U.S. Cl. D14—113



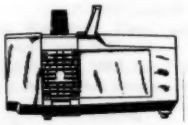
280,990
MOTORCYCLE ENGINE ROCKER COVER
William G. Davidson, Elm Grove, Wis., assignor to Harley-Davidson Motor Co., Inc., Milwaukee, Wis.
Filed Oct. 3, 1983, Ser. No. 538,205
Term of patent 14 years
U.S. Cl. D15—5



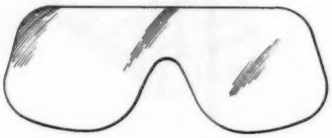
280,991
DRY BATTERY DRIVEN LIQUID PUMP
Eiki Maruyama, Nagano, Japan, assignor to Maruyama Industrial Co. Ltd., Kanano, Japan
Filed Feb. 9, 1983, Ser. No. 465,184
Claims priority, application Japan, Oct. 29, 1980, 55-45533
Term of patent 14 years
U.S. Cl. D15—7

280,992
DRY BATTERY DRIVEN LIQUID PUMP
Eiki Maruyama, 225, Okada, Shinonoi, Nagano City, Nagano Pref., Japan
Filed Feb. 9, 1983, Ser. No. 465,187
Claims priority, application Japan, Mar. 4, 1981, 56-8770
Term of patent 14 years
U.S. Cl. D15—7

280,993
COMPRESSOR
James F. Mariol, Cincinnati, Ohio, assignor to The Scott & Fetzer Company, Lakewood, Ohio
Filed Aug. 3, 1983, Ser. No. 519,917
Term of patent 14 years
U.S. Cl. D15—9



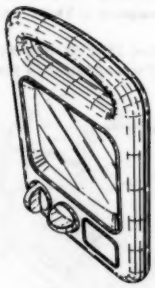
280,994
SUNGLASS LENS OR SIMILAR ARTICLE
Robert E. Abate, Quincy, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Nov. 22, 1982, Ser. No. 443,178
Term of patent 14 years
U.S. Cl. D16—112



280,995
Patent Not Issued For This Number

280,996
STRINGING BEADS
Melvin Epstein, Williamsville, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Jan. 20, 1983, Ser. No. 459,491
Term of patent 14 years
U.S. Cl. D21—59

280,997
TOY MIRROR
Harry S. Thomson, Richmond; David M. Raffo, and John A. Pape, both of Hitchin, all of England, assignors to Hestair Kiddicraft Limited, Surrey, England
Filed May 2, 1983, Ser. No. 490,867
Claims priority, application United Kingdom, Nov. 12, 1982, 821009670
Term of patent 14 years
U.S. Cl. D21—59



280,998

TOY DOLL HOUSE

Timothy A. Effler, and Dale I. Goldberg, both of Cincinnati, Ohio, assignors to CPG Products Corp., Minneapolis, Minn.

Filed Jan. 12, 1984, Ser. No. 570,154

Term of patent 14 years

U.S. Cl. D21—115

280,999

TOY DOLL HOUSE

Kathryn A. Cavnar, Covington, Ky., assignor to CPG Products Corp., Minneapolis, Minn.

Filed Feb. 8, 1984, Ser. No. 578,254

Term of patent 14 years

U.S. Cl. D21—115

281,000

TOY VEHICLE

Wayne A. Kuna, Oak Park; John R. Wildman, North Riverside; Gale D. Jenkins, Jr., Bolingbrook, and Mitchel J. Frumkin, Villa Park, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Apr. 11, 1983, Ser. No. 485,340

Term of patent 14 years

U.S. Cl. D21—134

281,001

RECONFIGURABLE TOY VEHICLE

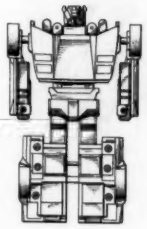
Kouzin Ohno, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1984, Ser. No. 587,389

Claims priority, application Japan, Sep. 2, 1983, 58-38333

Term of patent 14 years

U.S. Cl. D21—136



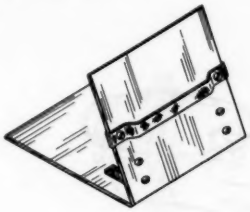
281,002
TOY RAILWAY TRACK SECTION
Flemming H. Olsen, Espergaerde, Denmark, assignor to Interlego A.G., Baar, Switzerland
Filed Dec. 10, 1982, Ser. No. 448,752
Term of patent 14 years
U.S. Cl. D21—143

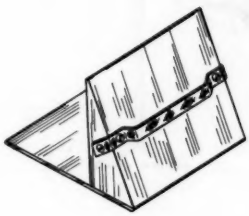
281,003
TOY BEAR IN FORMAL DRESS
William J. Bainbridge, 740 Walnut St., Meadville, Pa. 16335
Filed Apr. 11, 1983, Ser. No. 483,917
Term of patent 14 years
U.S. Cl. D21—159

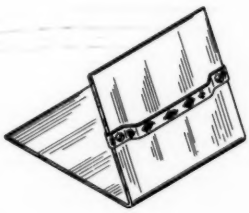
281,004
DOLL
David M. Kirshner, Los Angeles; Patricia Paris, San Diego, both of Calif.; Howard N. Bollinger, Cincinnati, Ohio; Dale I. Goldberg, Cincinnati, Ohio; Jane C. Abbott, Cincinnati, Ohio, and Linda Haupt, Cincinnati, Ohio, assignors to CPG Products Corp., Minneapolis, Minn.
Filed Jan. 20, 1983, Ser. No. 572,326
Term of patent 14 years
U.S. Cl. D21—171

281,005
ADJUSTABLE ANKLE STRAP FOR AN EXERCISE DEVICE
Greg S. Larsen, P.O. Box 1045, Sun Valley, Calif. 91352
Filed Nov. 4, 1983, Ser. No. 548,634
Term of patent 14 years
U.S. Cl. D21—191

281,006
SIT-UP EXERCISE ANCHOR
Ray D. Durushia, 4241 Second St., NE., Columbia Heights, Minn. 55421
Filed Nov. 7, 1983, Ser. No. 549,172
Term of patent 14 years
U.S. Cl. D21—191

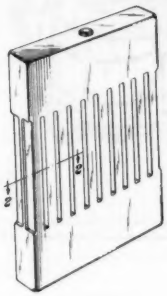




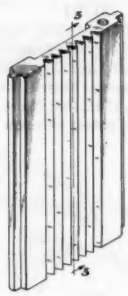


281,007
PAINT CUP ASSEMBLY
Joseph L. Terrels, 111 S. Bolmar St., West Chester, Pa. 19380
Filed May 17, 1982, Ser. No. 379,019
Term of patent 14 years
U.S. Cl. D23—18

281,008
THERMOPLASTIC PANEL FOR STORING A THERMAL ENERGY STORAGE MATERIAL
Wayne R. Hutter; Paul J. Moses, and James E. Kosinski, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed May 13, 1983, Ser. No. 494,473
Term of patent 14 years
U.S. Cl. D23—72



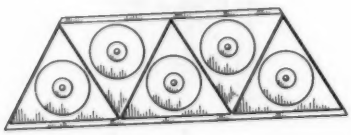
281,009
THERMOPLASTIC PANEL FOR STORING A THERMAL ENERGY STORAGE MATERIAL
Paul J. Moses; James E. Kosinski, and Wayne R. Hutter, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed May 13, 1983, Ser. No. 494,477
Term of patent 14 years
U.S. Cl. D23—72



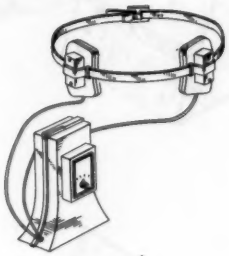
281,010
DISPENSER FOR AIR TREATING MATERIAL
Yves Joyaux, Poitiers, France, assignor to Airwick Industries, Inc., Carlstadt, N.J.
Filed Jul. 20, 1983, Ser. No. 515,415
Claims priority, application Spain, Jan. 24, 1983, 103287
Term of patent 14 years
U.S. Cl. D23—150

281,011
MOUTHPIECE FOR A SPIROMETER DEVICE
Joel N. Helfer, Cheshire, Conn., assignor to Chesebrough-Pond's Inc., Greenwich, Conn.
Filed Sep. 15, 1982, Ser. No. 418,319
Term of patent 14 years
U.S. Cl. D24—17

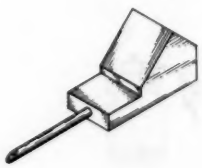
281,012
ELECTROCARDIOGRAPHIC ELECTRODE
Richard W. Beck, Centerville, Ohio; Kenneth R. Mandy, Sandy, and William G. Yates, Salt Lake City, both of Utah, assignors to Warner-Lambert Company, Morris Plains, N.J.
Filed Sep. 29, 1982, Ser. No. 427,217
Term of patent 14 years
U.S. Cl. D24—29



281,013
BELT MOUNTED MASSAGING UNIT
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011
Filed Feb. 11, 1983, Ser. No. 465,733
Term of patent 14 years
U.S. Cl. D24—40



281,014
ANGULATED VENIPUNCTURE NEEDLE
Jeffrey L. Brown, 60 Bates, Harrison, N.Y. 10528
Filed Jan. 31, 1983, Ser. No. 462,858
Term of patent 14 years
U.S. Cl. D24—52



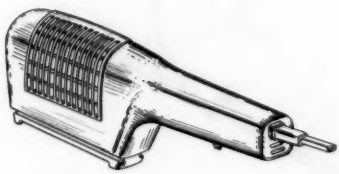
281,015
OIL LAMP
Robert B. Sher, P.O. Box 5551, Walnut Creek, Calif. 94596
Filed Mar. 14, 1983, Ser. No. 475,244
Term of patent 14 years
U.S. Cl. D26—110

281,016
COMBINATION ASHTRAY AND DRINK STAND
Ivan J. Domingue, Rte. 2, P.O. Box 20, Scott, La. 70583
Filed Feb. 18, 1983, Ser. No. 409,722
Term of patent 14 years
U.S. Cl. D27—12

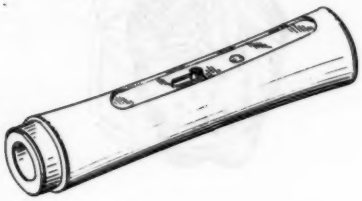
281,017
VITAMIN TABLET
Jim H. Martin, Huntington Beach, and Donnie R. Yancey, Tustin, both of Calif., assignors to Vita-Fresh Vitamin Company, Inc., Garden Grove, Calif.
Filed Nov. 2, 1983, Ser. No. 547,795
Term of patent 14 years
U.S. Cl. D28—3

281,018
VITAMIN TABLET
Jim H. Martin, Huntington Beach, and Donnie R. Yancey, Tustin, both of Calif., assignors to Vita-Fresh Vitamin Company, Inc., Garden Grove, Calif.
Filed Nov. 2, 1983, Ser. No. 547,796
Term of patent 14 years
U.S. Cl. D28—3

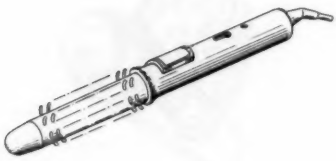
281,019
STYLER DRYER
Witold Pajak, Wayne, N.J., assignor to Conair Corporation, Edison, N.J.
Filed Sep. 12, 1983, Ser. No. 531,489
Term of patent 14 years
U.S. Cl. D28—13



281,020
DETACHABLE HANDLE FOR PERSONAL CARE APPLIANCES
James M. Rittenhouse, Watchung, N.J., assignor to Conair Corporation, Edison, N.J.
Filed Jul. 7, 1983, Ser. No. 511,635
Term of patent 14 years
U.S. Cl. D28—18

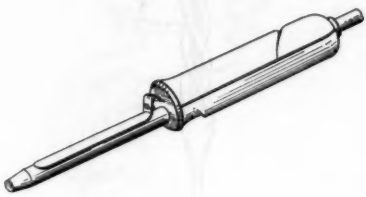


281,021
HAIR BRUSH
James M. Rittenhouse, Watchung, and James B. Stewart, Randolph, both of N.J., assignors to Conair Corporation, Edison, N.J.
Filed Jul. 7, 1983, Ser. No. 511,769
Term of patent 14 years
U.S. Cl. D28—29

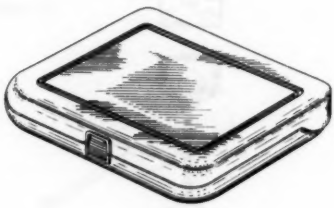


281,022
CURLING IRON
James M. Rittenhouse, Watchung, N.J., assignor to Conair Corporation, Edison, N.J.
Filed Jul. 7, 1983, Ser. No. 511,633
Term of patent 14 years
U.S. Cl. D28—35

281,023
CURLING IRON
James M. Rittenhouse, Watchung, and James B. Stewart, Randolph, both of N.J., assignors to Conair Corporation, Edison, N.J.
Filed Jul. 7, 1983, Ser. No. 511,639
Term of patent 14 years
U.S. Cl. D28—35

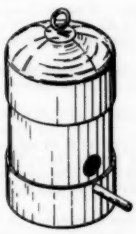


281,024
CARRYING CASE FOR A HAIR CURLER
James M. Rittenhouse, Watchung, N.J., and Anthony Leung, North Point, Hong Kong, assignors to Conair Corporation, Edison, N.J.
Filed Aug. 17, 1983, Ser. No. 520,806
Term of patent 14 years
U.S. Cl. D28—38



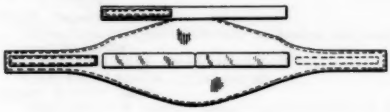
281,025
FOLDING RAZOR
Stephen K. Hindson, Pakuranga, New Zealand, assignor to Gabriel La Hood, Auckland, New Zealand
Filed Jul. 8, 1983, Ser. No. 511,964
Claims priority, application New Zealand, Feb. 15, 1983, 18227; Australia, Apr. 12, 1983, 18316; New Zealand, Apr. 13, 1983, 3477/83
Term of patent 14 years
U.S. Cl. D28—46

281,026
BIRD HOUSE
Estill Burke, 9085 W. Wabash, Andrews, Ind. 46702, and Roland L. Whitney, 1114A First St., Huntington, Ind. 46750
Filed Oct. 20, 1983, Ser. No. 543,920
Term of patent 14 years
U.S. Cl. D30—3



281,027
ENVIRONMENTAL WATER CONSERVATION CISTERN
Dan E. Hisken, 1517 Yolo, Corning, Calif. 96021, and Ed Stricker, 1237 Aloha, Red Bluff, Calif. 96080
Filed Sep. 16, 1982, Ser. No. 418,822
Term of patent 14 years
U.S. Cl. D30—16

281,028
FLUORESCENT AND REFLECTING SAFETY VEST FOR PETS
Kenneth A. Nichols, 40 Garfield St., Watertown, Mass. 02172
Filed Mar. 14, 1983, Ser. No. 475,298
Term of patent 14 years
U.S. Cl. D30—37



281,029
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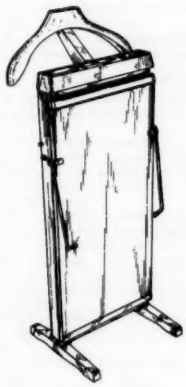
David J. Marrs, East Molesey, England, assignor to John Corby Limited, Windsor, England
Filed Sep. 7, 1983, Ser. No. 530,056
Term of patent 14 years
U.S. Cl. D32—9



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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Turnbull, Lennox B.; Donohue, John A.; and Jagdmann, Gunnar E., Jr., 4,547,518, Cl. 514-403.000.

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Wormgoor, Arend J., 4,546,729, Cl. 119-37.000.

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Rockwood, Robert E.; and Ximenes, Victor, 4,547,771, Cl. 340-683.000.

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Fujita, Yosuke; Tohda, Takao; Matsuoka, Tomizo; Abe, Atsushi; and Nitta, Tsuneharu, 4,547,703, Cl. 313-509.000.

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Abels, Theodor, to Linde Aktiengesellschaft. Hydrostatic-transmission control system, especially for lift and other industrial vehicles. 4,546,847, Cl. 180-307.000.

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De Vita, Joseph P.; Mulder, Thomas J.; O'Mohundro, Kenneth J.; Wellington, Leslie J.; Deeter, Wayne R.; and Sternaman, Larry D., 4,547,880, Cl. 370-91.000.

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Ackerman, Michael H.: *See*—
Malherbe, Roger F.; and Ackerman, Michael H., 4,547,537, Cl. 524-97.000.

A'Costa, Anthony. Rifled bore construction for a gun barrel. 4,546,564, Cl. 42-76.00R.

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Varadarajan, Hemmige D., 4,547,881, Cl. 307-296.00R.
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Kodama, Hisashi, 4,546,734, Cl. 123-90.160.
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Tanase, Teruyoshi; Nishigaki, Kenichi; and Ajima, Tatsuro, 4,547,470, Cl. 501-87.000.

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Eriksoo, Edgar; Sandberg, Eva B.; and Stalhandske, Lars J. T., 4,547,511, Cl. 514-312.000.

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Hellekant, Otto E., 4,547,185, Cl. 494-37.000.

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Stitt, Edward M., 4,547,001, Cl. 283-81.000.

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Armstrong, Joe W. Method for printing indicia on porous sheets. 4,547,406, Cl. 427-282.000.

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Blossick, Raymond B.; Bortzfield, Frank M.; Brown, Kenneth E.; Herr, Joseph H.; and Rannels, Gerald L., 4,546,574, Cl. 51-170.00T.
Colyer, Timothy D., 4,547,245, Cl. 156-220.000.

Arnold, Fred E.: *See—*
Reinhardt, Bruce A.; Arnold, Fred E.; and Unroe, Marilyn R., 4,547,592, Cl. 568-33.000.

Arthur D. Little, Inc.: *See—*
Santhanam, Chakra J., 4,546,612, Cl. 62-55.000.

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Swartz, Harold S. R.; and Arthurs, Trudy, 4,546,992, Cl. 280-282.000.

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Dusel, Robert O.; and Blaha, Gerald E., 4,546,526, Cl. 29-33.00M.

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Fukuoka, Shinsuke; Chono, Masazumi; Watanabe, Tomonari; and Kohno, Masashi, 4,547,322, Cl. 260-453.00P.

Hattori, Yasuo; Morita, Hideo; and Inoki, Yoshihiro, 4,547,560, Cl. 526-340.000.
Kojima, Akira; Yoshida, Saburo; Yamada, Yoshio; Shioda, Seiji; and Isoshima, Kazumi, 4,547,423, Cl. 428-315.500.
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Morisawa, Tahei, 4,547,052, Cl. 354-152.000.
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Arai, Masayuki; Ogasawara, Terumi; and Shikano, Tohru, 4,547,808, Cl. 358-228.000.
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Adolfsson, Morgan; and Brogardh, Torgny, 4,547,729, Cl. 324-96.000.
Hellman, Per-Ake; and Stenstrom, Lennart, 4,547,831, Cl. 361-127.000.
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Chang, Biau-Hung, 4,547,595, Cl. 568-454.000.
Ashman, Arthur; and Bruins, Paul F., to Medical Biological Sciences, Inc. Process of making implantable prosthesis material of modified polymeric acrylic (PMMA) beads coated with PHEMA and barium sulfate. 4,547,390, Cl. 427-2.000.
Ashman, Arthur: *See—*
Bruins, Paul F.; and Ashman, Arthur, 4,547,327, Cl. 264-16.000.
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Rutherford, David G.; Helling, Bernd; and Long, John H., 4,547,810, Cl. 358-256.000.
Astrom, Ingemar, to Gotaverken Energy Systems AB. Apparatus for the combustion of carbonaceous material. 4,546,709, Cl. 110-216.000.
AT&T Bell Laboratories: *See—*
Lehman, Harvey R.; and Slana, Matthew F., 4,547,877, Cl. 370-58.000.
AT&T Information Systems Inc.: *See—*
Ngo, Peter D. T., 4,547,042, Cl. 350-334.000.
AT&T Technologies, Inc.: *See—*
Bair, Wallace C.; Myers, Daryl L.; and Rogers, Jane W., 4,547,644, Cl. 219-10.49R.
Phaneuf, John B., 4,546,543, Cl. 29-884.000.
Viriyayuthakorn, Montri; and DeBoo, Robert V., 4,547,246, Cl. 156-244.120.
AT&T Teletype Corporation: *See—*
Jung, Werner; and Purzycki, Alfred Z., 4,547,089, Cl. 400-354.000.
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Briffod, Jean-Paul, 4,547,646, Cl. 219-69.00W.
Schneider, Rudolf, 4,547,647, Cl. 219-69.00W.
Atlantic Richfield Company: *See—*
Ingram, Alvin R., 4,547,527, Cl. 521-60.000.
Johnson, Marvin F. L., 4,547,608, Cl. 585-500.000.
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,547,607, Cl. 585-500.000.
Jones, C. Andrew; and Sofranko, John A., 4,547,611, Cl. 585-500.000.
Josefowicz, Jack Y., 4,547,272, Cl. 204-67.000.
Miller, Richard F., 4,547,202, Cl. 44-62.000.
Pinault, Frances S., 4,547,354, Cl. 423-587.000.
Rowlette, John J.; Clough, Thomas J.; Josefowicz, Jack Y.; and Sibert, John W., 4,547,443, Cl. 429-217.000.
Skinner, James L., 4,547,198, Cl. 44-1.00R.
Sofranko, John A.; and Withers, Howard P., Jr., 4,547,610, Cl. 585-500.000.
Atochem: *See—*
Olah, George A., 4,547,474, Cl. 502-168.000.
Audhya, Tapan: *See—*
Goldstein, Gideon; Heavner, George; Audhya, Tapan; and Tjoeng, Foe-Siong, 4,547,489, Cl. 514-11.000.
Autenrieth, Veit: *See—*
Hofle, Lothar; and Autenrieth, Veit, 4,547,105, Cl. 408-141.000.
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Burns, Edgar A.; and Johnson, James W., 4,547,032, Cl. 339-90.00R.
Kutnyak, Thomas A.; and Tolbert, Thomas W., 4,547,029, Cl. 339-16.00R.
Torgersen, Robert H., 4,546,920, Cl. 239-102.000.
Van Brunt, Michael K.; and Madle, Peter, 4,547,623, Cl. 174-35.00R.
Avellino, Frank J.; and Johnson, Robert R., to GTE Products Corporation. Apparatus for monitoring the performance of a press or like machine. 4,547,891, Cl. 377-16.000.
Avidan, Amos A.; Gould, Ronald M.; and Kane, Steven E., to Mobil Oil Corporation. Conversion of oxygenates to lower olefins in a turbulent fluidized catalyst bed. 4,547,616, Cl. 585-640.000.
Ayers, William, to Energy Conversion Devices, Inc. Mobile atom insertion reaction, mobile atom transmissive membrane for carrying out the reaction, and reactor incorporating the mobile atom transmissive membrane. 4,547,273, Cl. 204-73.00R.
B. Bunch Company, Inc.: *See—*
Bunch, Earnest B., Jr., 4,547,184, Cl. 493-414.000.
B. F. Goodrich Company, The: *See—*
Lai, John T.; and Son, Pyong N., 4,547,538, Cl. 524-100.000.
Landsness, Clifford A., 4,547,251, Cl. 156-415.000.
Schneider, Wolfgang; and Lenczyk, John P., 4,547,599, Cl. 570-241.000.
Babcock & Wilcox Company, The: *See—*
Butt, Donald B.; and Young, William C., 4,547,649, Cl. 219-121.0LF.
Babson, Edward; Porter, Michael R.; and Porter, Robert E., to Porter Sewing Machines, Inc. Double overlock seamer. 4,546,716, Cl. 112-162.000.
Bachot, Jean; Quentin, Jean-Pierre; and Bourgeois, Jean-Luc, to Chloe Chimie. Process for preparing ion-exchange membranes. 4,547,411, Cl. 427-393.500.
Backman, Ralf, to WAMAC AB. Method and apparatus for coordinating streams of newspapers branched off from a stream of newspapers. 4,546,962, Cl. 270-54.000.
Bagli, Jehan: *See—*
Bellini, Francesco; and Bagli, Jehan, 4,547,516, Cl. 514-385.000.
Bailey, Danny J. Fishing line sinker. 4,546,567, Cl. 43-44.870.
Bailey, Fay W.; and Whitte, William M., to Phillips Petroleum Company. Ethylene polymer blends and process for forming film. 4,547,551, Cl. 525-240.000.
Bailey, James T., Jr., to United States Forgecraft Corporation. Safety hook construction. 4,546,523, Cl. 24-241.0PP.
Bair, Wallace C.; Myers, Daryl L.; and Rogers, Jane W., to AT&T Technologies, Inc. Apparatus for heating a preform from which lightguide fiber is drawn. 4,547,644, Cl. 219-10.49R.
Baker, Hugh W. B.; Buckle, Valerie A.; and Fehr, Ivor J. M., to Gillette Company, The. Writing instrument with nib operated valve. 4,547,090, Cl. 401-235.000.
Baker, Jerry D.: *See—*
Sebenik, Roger F.; Baker, Jerry D.; and Laferty, John M., 4,547,345, Cl. 423-53.000.
Baker, Roy F.; and Banach, Frank G., to Zenith Electronics Corporation. Television AFC system usable with offset carrier frequencies. 4,547,805, Cl. 358-195.100.
Balch, John A.: *See—*
Sovis, John F.; and Balch, John A., 4,547,206, Cl. 55-255.000.
Ball Corporation: *See—*
Ananias, James W., 4,547,211, Cl. 65-29.000.
Sanford, Gary G.; and Paschen, Dean A., 4,547,779, Cl. 343-700.0MS.
Ball, Graham J., to BOC Group plc, The. Gas mixing apparatus. 4,546,794, Cl. 137-599.000.
Balland, Jean, to Societe Anonyme dite Manufacture de Produit Chimiques Protex. Process for fixing direct and reactive dyestuffs on cellulosic fibers with addition of magnesium salt and zirconium salt to fixing agent. 4,547,196, Cl. 8-496.000.
Ballato, Arthur, to United States of America, Army. Frequency synthesizer using a matrix of selectable piezoelectric resonators. 4,547,748, Cl. 331-49.000.
Ballreich, Kurt; Jensen, Ernst; and Knappworst, Jurgen, to Dynamit Nobel Aktiengesellschaft. Training cartridge with plastic projectile or dummy projectile. 4,546,704, Cl. 102-444.000.
Banach, Frank G.: *See—*
Baker, Roy F.; and Banach, Frank G., 4,547,805, Cl. 358-195.100.
Bancelin, Bernard: *See—*
Dumont, Bernard; Proponet, Christian; Bancelin, Bernard; Brucker, Roland; Bories, Jean-Louis; and Klein, Christiane, 4,547,834, Cl. 361-386.000.
Baradel, Agostino: *See—*
Guerriero, Renato; Veronese, Giuseppe; Baradel, Agostino; and Rivola, Luigi, 4,547,346, Cl. 423-87.000.
Barnett, Paul F.: *See—*
Bullock, Norman J.; Barnett, Paul F.; and Lattis, Donald J., 4,546,554, Cl. 34-48.000.
Barnett, Ronald E.: *See—*
Riemer, Jed A.; Zanno, Paul R.; and Barnett, Ronald E., 4,547,584, Cl. 560-71.000.
Barouk, Louis S.; and Mayzaud, Maurice P., to Etablissements Mayzaud Maurice, by said Maurice P. Mayzaud. Shoe, more especially for patients having undergone a surgical operation on the fore-foot. 4,546,557, Cl. 36-110.000.
Barr, Robert M. S.: *See—*
Reed, Leonard W.; Barr, Robert M. S.; and Dick, David A., 4,547,416, Cl. 428-36.000.
Bartelsson, Nils: *See—*
Andersson, Kurt; Bartelsson, Nils; and Bondesson, Stig, 4,546,940, Cl. 244-3.290.
Barth, Edward G.; Braude, Ruvim; and Kay, Nicholas W., to Burroughs Corporation. Dielectric composition and devices using it. 4,547,467, Cl. 501-20.000.
Bartlett, Robert H. Autotransfusion system. 4,547,186, Cl. 604-4.000.
BASF Aktiengesellschaft: *See—*
Bergmann, Udo; Hansen, Guenter; and Zeidler, Georg, 4,547,566, Cl. 534-684.000.

Hoffmann, Gerhard; Bronstert, Bernd; Hahn, Herbert; and Jun, Mong-Jon, 4,547,454, Cl. 430-271.000.
Marx, Hans-Norbert, 4,547,366, Cl. 424-78.000.
Naarmann, Herbert, 4,547,270, Cl. 204-58.500.

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Geist, Michael; and Diefenbach, Horst, 4,547,409, Cl. 427-386.000.

BASF Wyandotte Corporation: *See—*
Deck, Charles F.; and Carson, James E., 4,547,303, Cl. 252-73.000.

Bassler, Elmer A., Jr.: *See—*
Shields, Edward P.; and Bassler, Elmer A., Jr., 4,547,117, Cl. 414-404.000.

Bath, Duncan T.; and Ferguson, James H., to Canadian General Electric Co., Ltd. Flexible stator slot closure arrangement. 4,547,690, Cl. 310-214.000.

Batstra, Ype, to International Osobouw Sales Office N.V. Method for manufacturing light-weight shaped concrete articles, such as block-shaped building elements. 4,547,331, Cl. 264-333.000.

Baumeister, Hans-Peter, to Eastman Kodak Company. Digital circuit with improved input/output connections. 4,547,056, Cl. 354-412.000.

Bawa, Mohendra S.: *See—*
Witter, David E.; and Bawa, Mohendra S., 4,547,258, Cl. 156-605.000.

Baxter, Otela; and Spector, George. Mountain climb and slide. 4,546,965, Cl. 272-56.50R.

Bayer Aktiengesellschaft: *See—*
Boehmke, Gunther; Mazanek, Jan; Botsch, Hans-Jurgen; and Schneider, Gottfried, 4,547,199, Cl. 44-51.000.
Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Reinecke, Paul; and Scheinpflug, Hans, 4,547,515, Cl. 514-383.000.
Kuhle, Engelbert; Paulus, Wilfried; Genth, Hermann; Reinecke, Paul; and Rosslenbroich, Hans-Jurgen, 4,547,517, Cl. 514-390.000.
Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,547,503, Cl. 514-254.000.
Wegner, Christian, 4,547,561, Cl. 528-60.000.
Zabrocki, Karl; Tiburtius, Christoph; Doring, Joachim; and Richter, Klaus, 4,547,533, Cl. 523-206.000.

Bayer, Robert S.; and Petronaci, Mark A., to American Standard Inc. Phase shift demodulator. 4,547,738, Cl. 329-107.000.

Bayerische Motoren Werke Aktiengesellschaft: *See—*
Radermacher, Karl-Heinz; and Haberl, Josef, 4,547,717, Cl. 318-484.000.

Bazard, Daniel: *See—*
Moll, Manfred; Bazard, Daniel; Niclause, Michel; Vincent, Louis-Marie; and Andre, Jean-Claude, 4,547,070, Cl. 356-339.000.

BBC Brown, Boveri & Company Limited: *See—*
Horler, Hansulrich, 4,547,083, Cl. 384-535.000.
Maschek, Martin, 4,547,742, Cl. 330-149.000.

Beasom, James D., to Harris Corporation. I^2L Structure and fabrication process compatible with high voltage bipolar transistors. 4,546,539, Cl. 29-577.00C.

Beaussant, Raymond, to Intertechnique. Device for protection against accelerations. 4,546,491, Cl. 2-2.10A.

Beazley, Todd M.; and Diller, Calvin D., to Tektronix, Inc. Method and apparatus for detection of non-linear electrical devices. 4,547,724, Cl. 324-57.00R.

Becker, Robert F.: *See—*
Young, Horace J.; Becker, Robert F.; and Will, Brian C., 4,547,109, Cl. 414-22.000.

Bedell, Stanley F.; and Viola, Michael S., to Polaroid Corporation. Ink jet transparency. 4,547,405, Cl. 427-256.000.

Bednarski, John R.; Gitlitz, Melvin H.; and Russo, David A., to M&T Chemicals Inc. Antifouling paint. 4,547,532, Cl. 523-122.000.

Beecham Inc.: *See—*
Lareau, Mary R., 4,547,300, Cl. 252-8.800.

Behrens AG: *See—*
Volkel, Elmar; and Bredow, Walter, 4,546,683, Cl. 83-27.000.

Behrmann, Georg. Transportable holding assembly for rapid erection of buildings. 4,546,578, Cl. 52-67.000.

Beierholm, Hans M.; and Thun, Niels, to Danfoss A/S. Electrical shock prevention means for high voltage DC regulators. 4,547,842, Cl. 363-35.000.

Bekker, Vladimir; Buchheim, Wayne J.; Vanderlinde, William; and Wang, Donald S. T., to Monsanto Company. Terpolymer processing aid for polyvinyl halide polymers. 4,547,428, Cl. 428-402.000.

Bell, Eugene, to Massachusetts Institute of Technology. Fabrication of living blood vessels and glandular tissues. 4,546,500, Cl. 623-1.000.

Bell Helicopter Textron Inc.: *See—*
Taylor, Robert R.; Bowen, Billy C.; and Emery, John H., 4,547,701, Cl. 313-500.000.

Bell, Noel G. Traveling trench shore. 4,547,097, Cl. 405-283.000.

Bell, Vivien L.; Ferguson, Ian J.; and Weatherley, Mark J., to Minnesota Mining and Manufacturing Company. Recording element for optical data storage. 4,547,444, Cl. 430-11.000.

Bellerose, Richard J., to J. C. Pitman Company, Inc. Potato slicer. 4,546,684, Cl. 83-355.000.

Bellin, Howard T.; Fellner, Donald; and Tchorbajian, Nichan. Portable EKG monitoring device for ST deviation. 4,546,776, Cl. 128-704.000.

Bellini, Francesco; and Bagli, Jehan, to American Home Products Corporation. Antisecretory agents derived from meldrum's acid. 4,547,516, Cl. 514-385.000.

Belmore, James E.: *See—*
Larson, Jay M.; Jenkins, Lawrence F.; and Belmore, James E., 4,547,229, Cl. 148-134.000.

Beltz, Thomas G. Truss system and components thereof. 4,546,591, Cl. 52-645.000.

Bengtsson, Bengt L.; and Lindberg, Peter, to Nestec S.A. Process of preparing frozen fruit or vegetables. 4,547,380, Cl. 426-302.000.

Benitez, Luiz N.: *See—*
Mahrus, Duraid; and Benitez, Luiz N., 4,547,336, Cl. 419-31.000.

Benner, Eugene L.: *See—*
Jackson, Keith L.; Benner, Eugene L.; Polley, Richard B.; and Wickman, James J., 4,546,706, Cl. 105-182.00E.

Bennett, David R.: *See—*
Welch, David P.; and Bennett, David R., 4,547,113, Cl. 414-49.000.

Bennett, James G., Jr.; and Tungate, Freddie L., to General Electric Company. Catalyst precursor prepared from manganese carbonate and a magnesium compound. 4,547,480, Cl. 502-159.000.

Bennett, Thomas M.: *See—*
Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Ogren, Dennis F.; Nakaniwa, Mikio; and Furukawa, Kenji, 4,547,284, Cl. 208-50.000.

Bennett, Tommy N. Tracer lite. 4,547,837, Cl. 362-186.000.

Benson, Jon M.; and Castle, Craig A., to Xomed, Inc. Replaceable battery pack for intra-oral larynx. 4,547,894, Cl. 381-70.000.

Beny, Janos; and Tompkins, David E. Method and apparatus for locating the dynamic axis of a sphere. 4,546,644, Cl. 73-65.000.

Berard, Claude: *See—*
Laviron, Andre ; and Berard, Claude, 4,547,861, Cl. 364-715.000.

Berard, Raymond A.: *See—*
Gendreau, Paul M.; Llort, Francisco M.; and Berard, Raymond A., 4,546,980, Cl. 273-218.000.

Berecz, Imre; and Hinton, Dennis L., to Microdot Inc. Adjustable torque responsive control. 4,546,833, Cl. 173-12.000.

Bergeron, David L., to International Business Machines Corporation. Trench-defined semiconductor structure. 4,547,793, Cl. 357-50.000.

Bergmann, David E. Apparatus and method for maintaining altitude and attitude of a neutral buoyancy balloon. 4,547,167, Cl. 446-220.000.

Bergmann, Udo; Hansen, Guenter; and Zeidler, Georg, to BASF Aktiengesellschaft. Copper, cobalt, nickel and iron complexes of disazo dyes. 4,547,566, Cl. 534-684.000.

Berkich, Ronald S. Slip-on screwdriver ratchet. 4,546,677, Cl. 81-62.000.

Berlec, Ivan: *See—*
Brinn, Walter K.; Berlec, Ivan; Davenport, John M.; Vukcevich, Milan R.; and Fridrich, Elmer G., 4,547,704, Cl. 315-71.000.

Berner, Kurt, to Ecoboard Limited. Apparatus for bonding sheet material. 4,547,254, Cl. 156-555.000.

Berry, Desmond J.: *See—*
Meyers, Graham J.; Hudson, Barry L.; and Berry, Desmond J., 4,546,787, Cl. 137-119.000.

Besenhard, Jurgen O.; Wudy, Erich; and Fritz, Heinz P., to Varta Batterie Aktiengesellschaft. Lithium battery electrode frame. 4,547,442, Cl. 429-209.000.

Besson, Raymond: *See—*
Valdois, Michel; Maitre, Pierre; Besson, Raymond; and Boy, Jean-Jacques, 4,547,691, Cl. 310-361.000.

Best, John S.; Lee, Kenneth; and Tsang, Ching H., to International Business Machines Corporation. Dual biasing for integrated inductive MR head. 4,547,824, Cl. 360-113.000.

Best, Robert H., to Burlington Industries, Inc. Automatic failure sensor for hot wire cutters. 4,546,802, Cl. 139-336.000.

Best, Willie H. Radiant wall oven and process of drying coated objects. 4,546,553, Cl. 34-39.000.

Beyer, Kenneth E.; and Horlacher, Wilhelm H., to Honeywell Inc. Two-stage solenoid valve. 4,546,955, Cl. 251-129.150.

Bharucha, Kekhusroo R.; and Slemon, Clarke E., to Canada Packers Inc. Process for the electrochemical reduction of 7-ketolithocholic acid to ursodeoxycholic acid. 4,547,271, Cl. 204-59.00R.

Bialas, John S., Jr.; Daniels, Richard J.; and Mruk, William J., to International Business Machines Corporation. Precision regulation, frequency modulated substrate voltage generator. 4,547,682, Cl. 307-297.000.

Bieber, William J. H-Pattern shifter for automatic transmissions. 4,546,665, Cl. 74-473.00R.

Biermann, Wendell J., to United States of America, Energy. Absorption machine with desorber-resorber. 4,546,620, Cl. 62-476.000.

Bilco Company, The: *See—*
Lyons, Robert J., 4,546,855, Cl. 182-106.000.

Bilz, Axel: *See—*
Hofle, Lothar; and Autenrieth, Veit, 4,547,105, Cl. 408-141.000.

Bilz, Reiner: *See—*
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Bingham, David, to Intersil, Inc. High speed charge balancing comparator. 4,547,683, Cl. 307-355.000.

BioNexus, Inc.: *See—*
Bolduc, Lee R., 4,547,188, Cl. 604-55.000.

Bird Electronic Corporation: *See—*
Mecklenburg, Frank H., 4,547,728, Cl. 324-95.000.

Bischoff, Martin: *See—*
Hase, Christian; Bischoff, Martin; Schmadel, Edmund; and Vogt, Gunther, 4,547,306, Cl. 252-99.000.

Bison-Werke Bahre & Greten GmbH & Co. KG: *See—*
Fischer, Kurt, 4,546,572, Cl. 51-140.000.

Bizerba-Werke Wilhelm Kraut GmbH & Co. KG: *See—*
Maurer, Albrecht; Butz, Alois; and Koch, Klaus, 4,546,685, Cl. 83-707.000.

Black & Decker, Inc.: *See—*
Schaeffer, Robert L., 4,546,697, Cl. 99-279.000.

Blacksberg, Richard; and Isaacs, Michael S., to U.S. Balloon Mfg. Co., Inc. Inflatable assembly with surface closure. 4,547,168, Cl. 446-222.000.

Blaha, Gerald E.: *See*—
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Blake, William: *See*—
Allen, Peter N.; and Blake, William, 4,547,885, Cl. 372-58.000.

Blaser, Richard F.; and Blaser, Walter L. Premixed charge conditioner for internal combustion engine. 4,546,752, Cl. 123-568.000.

Blaser, Walter L.: *See*—
Blaser, Richard F.; and Blaser, Walter L., 4,546,752, Cl. 123-568.000.

Blatter, Albrecht, to W. Schneeberger AG, Maschinenfabrik. Circulating roller bearing. 4,547,023, Cl. 308-6.00C.

Blevins, Bruce D. Troll master. 4,546,565, Cl. 43-43.130.

Blinn, Harold A.: *See*—
Oliver, Brian H.; Blinn, Harold A.; and Carvalho, Robert I., 4,547,422, Cl. 428-286.000.

Block, Jacob, to W. R. Grace & Co. High temperature drilling mud stabilizer. 4,547,297, Cl. 252-8.50A.

Bloome, James A.; and Shaw, Jimmie, to Kartridg Pak Co., The. Meat separating means. 4,546,927, Cl. 241-74.000.

Bloomer, Milton D., to General Electric Company. Circuit for preventing excessive power dissipation in power switching semiconductors. 4,547,828, Cl. 361-86.000.

Blossick, Raymond B.; Bortzfield, Frank M.; Brown, Kenneth E.; Herr, Joseph H.; and Rannels, Gerald L., to Armstrong World Industries, Inc. Press cleaning apparatus. 4,546,574, Cl. 51-170.00T.

Blume, Cheryl D.; and Bonner, Paul H., to Mylan Pharmaceuticals Inc. Pharmaceutical combination composition and associated method. 4,547,498, Cl. 514-225.000.

Bobik, Carl F.: *See*—
Huseby, Irvin C.; and Bobik, Carl F., 4,547,471, Cl. 501-98.000.

BOC Group plc, The: *See*—
Ball, Graham J., 4,546,794, Cl. 137-599.000.

Bock, Jan: *See*—
Schulz, Donald N.; Kowalik, Ralph M.; Bock, Jan; and Maurer, John J., 4,546,784, Cl. 137-13.000.

Bocker, Albert, to Albert Bocker GmbH & Co. KG. Load-carrying platform. 4,546,854, Cl. 182-103.000.

Bodnar, Ronald J. Engine air cut-off valve. 4,546,954, Cl. 251-88.000.

Boehmke, Gunther; Mazanek, Jan; Botsch, Hans-Jurgen; and Schneider, Gottfried, to Bayer Aktiengesellschaft. Use of aralkyl polyalkylene glycol ethers for the preparation of aqueous coal slurries. 4,547,199, Cl. 44-51.000.

Boehringer Ingelheim KG: *See*—
Zierenberg, Bernd; and Gupte, Arun R., 4,547,359, Cl. 424-22.000.

Boeing Company, The: *See*—
Adams, Clarence R., 4,546,575, Cl. 51-288.000.
Lubowitz, Hyman R.; and Sheppard, Clyde H., 4,547,553, Cl. 525-384.000.

Bogaert, Joseph M. F.: *See*—
Pansaerts, Marcel F. R.; Bogaert, Joseph M. F.; and Decolvenaer, Etienne K. A., 4,547,835, Cl. 361-399.000.

Bohan, John E., Jr., to Honeywell Inc. Control device with positive temperature coefficient impedance for limiting dissipated power. 4,546,918, Cl. 236-46.00R.

Bohner, Beat, to Ciba Geigy Corporation. 3,4-Di-(methylamino)-6-tert.-butyl-4,5-dihydro-1,2,4-triazin-5-one, its use as herbicide and a process for its production. 4,547,216, Cl. 71-93.000.

Bohnert, Jozef: *See*—
Martinko, Matyas; Elekes, Andras; Simon, Kalman; Bohnert, Jozef; Nemeth, Janos; Bole, Karoly; and Ilyes, Zoltan, 4,547,098, Cl. 405-291.000.

Boire, Daniel C.: *See*—
Freitag, Ronald G.; Degenford, James E.; and Boire, Daniel C., 4,547,745, Cl. 330-286.000.

Boitiaux, Jean-Paul: *See*—
Cosyns, Jean; and Boitiaux, Jean-Paul, 4,547,600, Cl. 585-259.000.

Bolduc, Lee R., to BioNexus, Inc. Material dispensing apparatus. 4,547,188, Cl. 604-55.000.

Bole, Karoly: *See*—
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Bolliger, Georg; and Stutz, Peter, to Sandoz Ltd. Ergot peptide derivatives, their preparation and pharmaceutical compositions containing them. 4,547,500, Cl. 514-250.000.

Bolt, Conway A., Jr.; Cassen, John W.; and Schrank, Helmut E., to United States of America, Navy. Loop antenna with improved balanced feed. 4,547,776, Cl. 343-741.000.

Bond, Armand P.: *See*—
Grobner, Paul J.; Bond, Armand P.; and Poznansky, Abraham, 4,547,338, Cl. 420-584.000.

Bond, Paul W.; and Rockrohr, James D., to International Business Corporation. Cathode ray tube display horizontal deflection system with delay compensation. 4,547,710, Cl. 315-403.000.

Bondesson, Stig: *See*—
Andersson, Kurt; Bartelsson, Nils; and Bondesson, Stig, 4,546,940, Cl. 244-3.290.

Bonfiglioli, Silverio, to Weber S.p.A. Electromechanical and pneumatic device for controlling the throttle position of a carburetor according to engine speed during accelerator release. 4,546,744, Cl. 123-339.000.

Bongers, Bernd: *See*—
Fischer, Thomas; and Bongers, Bernd, 4,546,669, Cl. 74-579.00E.

Bonner, Paul H.: *See*—
Blume, Cheryl D.; and Bonner, Paul H., 4,547,498, Cl. 514-225.000.

Bonneyrat, Alain M.; and Lanclais, Christian L., to Gilson Medical Electronics (France). Method and device for analyzing effluents for the detection of peaks. 4,546,643, Cl. 73-61.10C.

Bopst, John H., III. Adjustable and releasable accelerator pedal depressor system. 4,546,667, Cl. 74-526.000.

Borg-Warner Corporation: *See*—
Kountz, Kenneth J.; and Erth, Richard A., 4,546,618, Cl. 62-201.000.
Sturges, Fred D., 4,546,742, Cl. 123-41.050.

Bories, Jean-Louis: *See*—
Dumont, Bernard; Proponet, Christian; Bancelin, Bernard; Brucker, Roland; Bories, Jean-Louis; and Klein, Christiane, 4,547,834, Cl. 361-386.000.

Borsuk, Gerald M.: *See*—
Fogarty, John D.; and Borsuk, Gerald M., 4,547,802, Cl. 358-119.000.

Bortnick, Kenneth A. Tan-through wearing apparel and process for making the same. 4,546,493, Cl. 2-67.000.

Bortzfield, Frank M.: *See*—
Blossick, Raymond B.; Bortzfield, Frank M.; Brown, Kenneth E.; Herr, Joseph H.; and Rannels, Gerald L., 4,546,574, Cl. 51-170.00T.

Boschman, Everardus H., to Arbo Gereedschapsmakerij B.V. Mould for encapsulating parts of elements into a plastic material. 4,546,951, Cl. 249-95.000.

Bosworth, Warren M., Jr.; and Martin, Fred E., to Ektelon. Racquet stringing machine with improved racquet retaining standard. 4,546,977, Cl. 273-73.00A.

Botez, Dan; and Connolly, John C., to RCA Corporation. Method of making a laser array. 4,547,396, Cl. 427-87.000.

Botsch, Hans-Jurgen: *See*—
Boehmke, Gunther; Mazanek, Jan; Botsch, Hans-Jurgen; and Schneider, Gottfried, 4,547,199, Cl. 44-51.000.

Bottcher, Henning: *See*—
Hausberg, Hans-Heinrich; Bottcher, Henning; Gottschlich, Rudolf; Seyfried, Christoph; and Minck, Klaus-Otto, 4,547,576, Cl. 546-197.000.

Bouiller, Jean G.; Buisson, Marc F. B.; Jourdain, Gerard E. A.; Sandelis, Denis J. M.; and Urruty, Yves R. A., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Pressure drop regulating device. 4,546,606, Cl. 60-262.000.

Bourgeois, Jean-Luc: *See*—
Bachot, Jean; Quentin, Jean-Pierre; and Bourgeois, Jean-Luc, 4,547,411, Cl. 427-393.500.

Bourns, Inc.: *See*—
Wulff, Richard W., 4,547,795, Cl. 357-80.000.

Bourquin, Robert, to Alsthom-Atlantique. Apparatus for supplying gas under pressure and distributing it between n outlets. 4,546,796, Cl. 137-625.480.

Bouvet, Jean. Mill roll with increased juice flow capacity. 4,546,698, Cl. 100-121.000.

Bowen, Billy C.: *See*—
Taylor, Robert R.; Bowen, Billy C.; and Emery, John H., 4,547,701, Cl. 313-500.000.

Bowes, Emmerson, to Mobil Oil Corporation. Demetalation catalyst and a method for its preparation. 4,547,485, Cl. 502-314.000.

Boy, Jean-Jacques: *See*—
Valdois, Michel; Maitre, Pierre; Besson, Raymond; and Boy, Jean-Jacques, 4,547,691, Cl. 310-361.000.

Braid, Milton, deceased (by Frangatos, Gerassimos, executor), to Mobil Oil Corporation. Borate esters and lubricant compositions containing such esters. 4,547,302, Cl. 252-48.400.

Bramlett, Kenneth W.: *See*—
Dennis, James G.; Bramlett, Kenneth W.; and Jackson, G. C., Jr., 4,546,836, Cl. 175-107.000.

Brandes, Wilhelm: *See*—
Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Reinecke, Paul; and Scheinpflug, Hans, 4,547,515, Cl. 514-383.000.

Braude, Ruvim: *See*—
Barth, Edward G.; Braude, Ruvim; and Kay, Nicholas W., 4,547,467, Cl. 501-20.000.

Brauer, Hans; and Leeuwestein, Kurt, to Kocks Technik GmbH & Co. Apparatus for conveying tubular or bar-shaped rolled stock. 4,546,633, Cl. 72-252.000.

Brearley, Malcolm; and Farr, Glyn P. R., to Lucas Industries Public Limited Company. Hydraulic anti-skid braking systems for vehicles. 4,547,022, Cl. 303-6.00C.

Bredow, Walter: *See*—
Volkel, Elmar; and Bredow, Walter, 4,546,683, Cl. 83-27.000.

Bremer Vulkan AG Schiffbau Und Maschinenfabrik: *See*—
Schwarz, Hartmut B., 4,546,718, Cl. 114-39.000.

Brennan, Daniel F. Tree climbing apparatus. 4,546,851, Cl. 182-7.000.

Brennan, Michael E.; Templeton, James H.; and Yeakey, Ernest L., to Texaco Inc. Preparation of linear polyethylenepolyamines with silica-alumina catalysts. 4,547,591, Cl. 564-479.000.

Breslow, Jeffrey D.: *See*—
Jaworski, Eugene; and Breslow, Jeffrey D., 4,547,173, Cl. 446-457.000.

Bridges, Mark E., to Eastman Kodak Company. Finger over the lens detecting apparatus. 4,547,054, Cl. 354-268.000.

Bridgestone Tire Co., Ltd.: *See*—
Ueno, Kazunori; and Suizu, Yohji, 4,546,580, Cl. 52-126.100.

Briffod, Jean-Paul, to Ateliers des Charmilles, S.A. Method and apparatus for cutting off a portion of a workpiece by electrical discharge machining, and for supporting the portion cut off from the workpiece. 4,547,646, Cl. 219-69.00W.
Brigham, Alan: *See*—
Leary, David F.; and Brigham, Alan, 4,547,659, Cl. 219-544.000.
Brinn, Walter K.; Berlec, Ivan; Davenport, John M.; Vukcevich, Milan R.; and Fridrich, Elmer G., to General Electric Company. Higher efficiency incandescent lighting units. 4,547,704, Cl. 315-71.000.
Britax (Wingard) Limited: *See*—
Cunningham, Douglas J., 4,547,018, Cl. 297-483.000.
Brocchetti, Diego G.: *See*—
Maiorana, Stefano; Brocchetti, Diego G.; and Piacenza, Giuseppe, 4,547,495, Cl. 514-211.000.
Brodrene Gram A/S: *See*—
Gram, Klaus, 4,546,615, Cl. 62-73.000.
Brodsky, David L.; and Olsen, Harry O., Jr., to Superior Plastic Products Corp. Gastroenteric feeding tube. 4,547,192, Cl. 604-270.000.
Brody, David L., to Whitestone Products. Method and apparatus for continuously attaching elastic strands to disposable absorbent products. 4,547,243, Cl. 156-164.000.
Brogardh, Torgny: *See*—
Adolfsson, Morgan; and Brogardh, Torgny, 4,547,729, Cl. 324-96.000.
Brogli, Rudolf H.; Shamasunder, Bangalore I.; and Seth, Shivaji S., to United States of America, Energy. Low exchange element for nuclear reactor. 4,547,334, Cl. 376-389.000.
Brokaw, Adrian P.; and Maidique, Modesto A., to Analog Device, Incorporated. A-To-D converter of the successive-approximation type. 4,547,766, Cl. 340-347.0AD.
Broken Hill Proprietary Company Limited, The: *See*—
Debenham, Michael; Dalli, Alan G.; and Revill, Peter L., 4,546,873, Cl. 198-836.000.
Bronstert, Bernd: *See*—
Hoffmann, Gerhard; Bronstert, Bernd; Hahn, Herbert; and Jun, Mong-Jon, 4,547,454, Cl. 430-271.000.
Brooke, Dana: *See*—
David, Stephen T.; Brooke, Dana; and Gallian, Claude E., 4,547,358, Cl. 424-14.000.
Brotherston, Colin P., to Lucas Industries public limited company. Fuel pumping apparatus. 4,546,745, Cl. 123-387.000.
Brown, Alfred: *See*—
Long, Stephen L.; Cheung, Yin L.; and Brown, Alfred, 4,547,078, Cl. 374-42.000.
Brown, Brian M. Football holding device. 4,546,974, Cl. 273-55.00B.
Brown, Douglas S.: *See*—
Hall, Dale E.; and Brown, Douglas S., 4,547,278, Cl. 204-290.00R.
Brown, George L.; and Spencer, Arthur T., to SCM Corporation. Aqueous coating composition comprising self-emulsifiable ester of epoxy and acid containing addition polymer. 4,547,535, Cl. 523-404.000.
Brown, Kenneth E.: *See*—
Blossick, Raymond B.; Bortzfield, Frank M.; Brown, Kenneth E.; Herr, Joseph H.; and Rannels, Gerald L., 4,546,574, Cl. 51-170.00T.
Brown, Robert L. Hair treatment product. 4,547,364, Cl. 424-70.000.
Brown, Stewart C., to Tecstor, Inc. Head positioning servo for disk drives. 4,547,822, Cl. 360-78.000.
Brown & Williamson Tobacco Corporation: *See*—
Heaney, Richard; and Reed, Steven P., 4,547,253, Cl. 156-553.000.
Brucker, Roland: *See*—
Dumont, Bernard; Proponet, Christian; Bancelin, Bernard; Brucker, Roland; Bories, Jean-Louis; and Klein, Christiane, 4,547,834, Cl. 361-386.000.
Bruins, Paul F.; and Ashman, Arthur, to Medical Biological Sciences, Inc. Method for producing a porous prosthesis. 4,547,327, Cl. 264-16.000.
Bruins, Paul F.: *See*—
Ashman, Arthur; and Bruins, Paul F., 4,547,390, Cl. 427-2.000.
Brunell, Jack W.; and Stein, Robert W., to General Motors Corporation. Secondary reservoir for a fuel tank. 4,546,750, Cl. 123-514.000.
Bruno, Roberto; and Memmi, Massimo, to Zincroksid S.p.A. Process for the production of galvanized steel sheet protected by chromium and chromium oxide layers. 4,547,268, Cl. 204-28.000.
Bryson, Michael, to Electro-Voice, Incorporated. Dynamic loudspeaker. 4,547,632, Cl. 179-115.5VC.
Buchel, Karl H.: *See*—
Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Reinecke, Paul; and Scheinpflug, Hans, 4,547,515, Cl. 514-383.000.
Bucher, Claude; and Lagabe, Andre, to Pont-a-Mousson S.A. Packing seal for cast iron pipe joints. 4,546,987, Cl. 277-207.00A.
Bucher, Robert; and Kung, Walter, to Maschinenfabrik Sulzer-Ruti AG. Warp let-off control device for weaving machines. 4,546,801, Cl. 139-110.000.
Buchheim, Wayne J.: *See*—
Bekker, Vladimir; Buchheim, Wayne J.; Vanderlinde, William; and Wang, Donald S. T., 4,547,428, Cl. 428-402.000.
Buck, Alfred: *See*—
Kuhn, Falk; and Buck, Alfred, 4,546,623, Cl. 66-104.000.
Buckle, Valerie A.: *See*—
Baker, Hugh W. B.; Buckle, Valerie A.; and Fehr, Ivor J. M., 4,547,090, Cl. 401-235.000.
Budding, Hendrik A.: *See*—
Bulten, Eric J.; and Budding, Hendrik A., 4,547,320, Cl. 556-83.000.
Buering, Ulrich: *See*—
Goebert, Klaus; and Buering, Ulrich, 4,547,267, Cl. 204-4.000.
Buisson, Marc F. B.: *See*—
Bouiller, Jean G.; Buisson, Marc F. B.; Jourdain, Gerard E. A.; Sandelis, Denis J. M.; and Urruty, Yves R. A., 4,546,606, Cl. 60-262.000.
Bujold, Victor N. Earthquake-responsive valve motor. 4,546,660, Cl. 74-2.000.
Bulginov, Evgeny F.: *See*—
Alexandrov, Adolf M.; Bulginov, Evgeny F.; Yashin, Jury A.; and Kiselev, Igor V., 4,547,099, Cl. 406-149.000.
Bullock, James K., Sr., to Ammco Tools, Inc. Device and method for measuring steering axis inclination or a steerable wheel. 4,546,548, Cl. 33-203.000.
Bullock, Norman J.; Barnett, Paul F.; and Lattis, Donald J., to Cissell Manufacturing Company. Clothes dryer having variable position motor and moisture sensor. 4,546,554, Cl. 34-48.000.
Bulten, Eric J.; and Budding, Hendrik A., to Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek. Tin compounds. 4,547,320, Cl. 556-83.000.
Bunch, Earnest B., Jr., to B. Bunch Company, Inc. Delivery mechanism for paper sheet processing apparatus. 4,547,184, Cl. 493-414.000.
Bunker, Nathan S.: *See*—
Wong, Rayman Y.; and Bunker, Nathan S., 4,547,324, Cl. 260-502.40R.
Burch, David J. Portable car wash unit. 4,546,903, Cl. 222-130.000.
Burdick, Glen A.; Collins, Floyd K.; and Kuryla, Alan T., to North American Philips Consumer Electronics Corp. CRT Shunt retaining means. 4,547,697, Cl. 313-412.000.
Burghardt, Stanley M. Riser tee wrench. 4,546,679, Cl. 81-119.000.
Burlington Industries, Inc.: *See*—
Best, Robert H., 4,546,802, Cl. 139-336.000.
Burman, Howard: *See*—
Meitner, Edmund M.; and Burman, Howard, 4,547,819, Cl. 360-65.000.
Burns, Edgar A.; and Johnson, James W., to Automation Industries, Inc. Locking means for a plug and receptacle electrical connector. 4,547,032, Cl. 339-90.00R.
Burr, John, to M/A Com, Inc. Re-entrant cathode support. 4,547,693, Cl. 313-270.000.
Burroughs Corporation: *See*—
Barth, Edward G.; Braude, Ruvim; and Kay, Nicholas W., 4,547,467, Cl. 501-20.000.
Levy-Navarro, Bernardo; and Sylvernale, Ensi P., 4,547,764, Cl. 340-347.0DD.
McGraw, Cobern E.; Gazzero, Robert; and Christian, David E., 4,547,813, Cl. 358-285.000.
Burzynski, Alfred J.; and Tillman, James J., to Owens-Illinois, Inc. Tintable scratch resistant coating. 4,547,397, Cl. 427-164.000.
Busboom, Garry W.; and James, Larry R., to Allis-Chalmers Corp. Header pivot support. 4,546,600, Cl. 56-208.000.
Butler, Donald E., to Warner-Lambert Company. Tetrahydro-3,5-dioxo-1H-pyrrolizine-7a(5H)-carboxylic acid and benzyl esters and amides thereof and their use in reversing amnesia. 4,547,519, Cl. 514-413.000.
Butt, Donald B.; and Young, William C., to Babcock & Wilcox Company, The. Method for superficial marking of zirconium and certain other metals. 4,547,649, Cl. 219-121.0LF.
Buttarazzi, Patrick J. Apparatus for dispensing medication. 4,546,901, Cl. 221-10.000.
Butz, Alois: *See*—
Maurer, Albrecht; Butz, Alois; and Koch, Klaus, 4,546,685, Cl. 83-707.000.
C & H Contact Lens Inc.: *See*—
Cotie, Robert L., 4,547,049, Cl. 351-159.000.
C. I. Kasei Co., Ltd.: *See*—
Ekuan, Kenji, 4,546,898, Cl. 220-337.000.
C-I-L Inc.: *See*—
Cameron, Gordon M., 4,547,353, Cl. 423-522.000.
Cabinet Harle & Phelip: *See*—
Chermann, Jean-Claude; Jasmin, Claude; and Mathe, Georges, 4,547,369, Cl. 424-131.000.
Cadars, Patrick, to Valeo. Turbulator for a heat exchanger comprising a bundle of tubes, and a heat exchanger including such turbulators. 4,546,797, Cl. 138-38.000.
Cadieu, Fred J., to United States of America, Army. Method of directly crystallizing a (Sm+Ti):Fe=1:5 compound. 4,547,276, Cl. 204-192.00M.
Cahn, Robert P.; and Siegell, Jeffrey H., to Exxon Research and Engineering Co. Fluid induced transverse flow magnetically stabilized fluidized bed. 4,546,552, Cl. 34-1.000.
Califone International, Inc.: *See*—
Metzner, Robert G.; and Smith, Stephen H., 4,547,678, Cl. 290-40.00C.
California Institute of Technology: *See*—
Rowlette, John J.; Clough, Thomas J.; Josefowicz, Jack Y.; and Sibert, John W., 4,547,443, Cl. 429-217.000.
Cameron, Gordon M., to C-I-L Inc. Apparatus and processes for the concentration of sulphuric acid. 4,547,353, Cl. 423-522.000.
Cameron, John F. Speed and distance calculator for skis. 4,546,650, Cl. 73-490.000.
Camp, Walter M. Mechanical weed remover. 4,547,010, Cl. 294-50.900.
Campbell, Bryant A.; and Miller, Nicholas E., to Anicon, Inc. Chemical vapor deposition process. 4,547,404, Cl. 427-248.100.

Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., to Pfizer Inc. Dihydropyridines and their use in treating cardiac conditions and hypertension. 4,547,502, Cl. 514-253.000.

Campbell Soup Company: *See—*
Goldhahn, Stephen L., 4,547,383, Cl. 426-524.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See—*
Gill, Bernard B. J.; and Yergeau, Joseph L. P. M., 4,546,659, Cl. 73-864.620.

Canada Packers Inc.: *See—*
Bharucha, Kekhusroo R.; and Slemon, Clarke E., 4,547,271, Cl. 204-59.00R.

Canadian General Electric Co., Ltd.: *See—*
Bath, Duncan T.; and Ferguson, James H., 4,547,690, Cl. 310-214.000.

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Teitelbaum, Heshel, 4,547,071, Cl. 356-344.000.

Caniglia, Joseph E. Wiping device. 4,546,517, Cl. 15-214.000.

Cannella, Vincent D.; Hansell, Gregory L.; Yaniv, Zvi; and Vijan, Meera, to Energy Conversion Devices, Inc. High current thin film transistor. 4,547,789, Cl. 357-23.700.

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Kaneko, Shuzo; and Tamura, Yasuyuki, 4,547,787, Cl. 346-160.000.
Kataoka, Hiroyuki, 4,547,057, Cl. 354-415.000.
Kawabata, Takashi, 4,547,864, Cl. 364-824.000.
Kimura, Takashi, 4,547,815, Cl. 358-335.000.
Kitagishi, Nozomu; Yamaguchi, Shin; Sakai, Shinji; Kinoshita, Takao; Kawabata, Takashi; Shinoda, Nobuhiko; and Hosoe, Kazuya, 4,547,663, Cl. 250-201.000.
Shirai, Shigeru; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Misumi, Teruo, 4,547,448, Cl. 430-84.000.
Suzuki, Ryoichi; and Tokuda, Ryuji, 4,547,770, Cl. 340-636.000.
Tamura, Yasuyuki; Nakaoka, Masaki; Miyagi, Ken; Nogashima, Nao; Sue, Yasuhiko; Suda, Masashi; and Ariga, Masao, 4,547,628, Cl. 178-2.00B.

Cantatore, Giuseppe, to Ciba-Geigy S.p.A. Polymeric compounds containing piperidine and triazine radicals, process for their preparation, and their use as stabilizers for synthetic polymers. 4,547,548, Cl. 525-186.000.

Canzek, Ludvik. High speed catadioptric objective lens system. 4,547,045, Cl. 350-444.000.

Capital City Products Company: *See—*
Ertle, Raymond T., 4,547,352, Cl. 423-279.000.

Capriotti, Bruce W.: *See—*
Worns, John R.; Chase, James W.; and Capriotti, Bruce W., 4,547,453, Cl. 430-271.000.

Captive Plastics, Inc.: *See—*
Drozd, Edward J., Jr., 4,547,332, Cl. 264-339.000.

Carborundum Abrasives Company: *See—*
Caul, Lawrence D., 4,547,204, Cl. 51-298.000.

Carl Freudenberg, Firma: *See—*
Forch, Hans, 4,546,985, Cl. 277-134.000.

Carl-Zeiss-Stiftung: *See—*
Vogt, Peter; and Kunzmann, Horst, 4,547,664, Cl. 250-205.000.

Carlson, Gary M., to SCM Corporation. Synthesis of 2,2-dimethyl-4-methyleneglutaric acid and derivatives. 4,547,323, Cl. 260-465.400.

Carlson, John A., to Teleflex Incorporated. Method for attaching a fitting to a conduit of a push-pull control. 4,547,239, Cl. 156-73.500.

Caron, Bernard G.; and Hoffer, John C., to AMP Incorporated. Housing mountable on printed circuit board to interconnect fiber optic connectors. 4,547,039, Cl. 350-96.200.

Carpenter, Kent H.; Whorley, Gerald E., deceased (by Whorley, Diana, executrix); and Lennard, Thomas W., to Amax Inc. Reduction of MoO_3 and ammonium molybdates by ammonia in a rotary furnace. 4,547,220, Cl. 75-84.000.

Carr, Jesse M., Jr.; Sheler, Raymond E.; Richards, Frank J.; and Kelder, Eric, to Texasgulf Inc. Filtration of wet process superphosphoric acid. 4,547,295, Cl. 210-777.000.

Carrier Corporation: *See—*
Drucker, Alan S., 4,546,616, Cl. 62-174.000.
Whipple, Charles E., 4,546,820, Cl. 165-77.000.

Carson, James E.: *See—*
Deck, Charles F.; and Carson, James E., 4,547,303, Cl. 252-73.000.

Cartwright, Richard V., to Hercules Incorporated. Sensitization of water-in-oil emulsion explosives. 4,547,232, Cl. 149-2.000.

Carvalho, Robert I.: *See—*
Oliver, Brian H.; Blinn, Harold A.; and Carvalho, Robert I., 4,547,422, Cl. 428-286.000.

Casberg, John M., to Olin Corporation. Pool chemical tablet and container. 4,546,503, Cl. 4-496.000.

Case, Steven K., to University of Minnesota, Regents of the. Holographic method for producing desired wavefront transformations. 4,547,037, Cl. 350-3.750.

Cash, Walter, Jr.: *See—*
Watrous, Howard N.; Cash, Walter, Jr.; and Dixon, Weldon R., 4,547,114, Cl. 414-81.000.

Cassat, Robert; and Vignando, Bruno, to Rhone-Poulenc Industries. Metal-clad laminate adapted for printed circuits. 4,547,408, Cl. 427-375.000.

Cassella Aktiengesellschaft: *See—*
Greiner, Ulrich; Keil, Karl-Heinz; Heinrich, Rudolf; and Albrecht, Konrad, 4,547,429, Cl. 428-402.240.

Cassen, John W.: *See—*
Bolt, Conway A., Jr.; Cassen, John W.; and Schrank, Helmut E., 4,547,776, Cl. 343-741.000.

Cassese, Samuel E.; and Marquez, Walter, to Dataproducts Corporation. Horizontal paper form positioner and adjusting mechanism. 4,546,908, Cl. 226-74.000.

Castanier, Philippe, to Superior S.A. Luggage closing device. 4,547,006, Cl. 292-37.000.

Castenmiller, Wilhelmus A. M.: *See—*
Todt, Klaus H.; and Castenmiller, Wilhelmus A. M., 4,547,387, Cl. 426-602.000.

Castillo, Carmen S. Reinforced corner interlock on tray. 4,546,913, Cl. 229-33.000.

Castillo, David D. Glove apparatus for weightlifting presses. 4,546,495, Cl. 2-161.00A.

Castle, Craig A.: *See—*
Benson, Jon M.; and Castle, Craig A., 4,547,894, Cl. 381-70.000.

Caterpillar Tractor Co.: *See—*
Fogg, Jeffrey R., 4,546,696, Cl. 98-2.180.

Caul, Lawrence D., to Carborundum Abrasives Company. Resin systems for high energy electron curable resin coated webs. 4,547,204, Cl. 51-298.000.

Cea, Michael S., to Keene Corporation. Post cap for mounting fixture. 4,546,944, Cl. 248-219.200.

Cebal: *See—*
Couput, Francis, 4,546,892, Cl. 215-252.000.

Cech, Karl, to AKG Akustische a.Kino Gerate Gesellschaft. Shock absorbing support for microphones. 4,546,950, Cl. 248-610.000.

Celmer, Walter D.; Cullen, Walter P.; Maeda, Hiroshi; and Tone, Junsuke, to Pfizer Inc. Polyether antibiotic from streptomyces. 4,547,523, Cl. 514-375.000.

Centre de Recherche et de Development: *See—*
Moll, Manfred; Bazard, Daniel; Niclause, Michel; Vincent, Louis-Marie; and Andre, Jean-Claude, 4,547,070, Cl. 356-339.000.

Cerberus AG: *See—*
Muggli, Jurg; and Labhart, Martin, 4,547,675, Cl. 250-565.000.

Cerovsky, Karel: *See—*
Dvorsky, Drahomir; and Cerovsky, Karel, 4,547,574, Cl. 544-336.000.

Cerreta, James J. Bite size candy molding machine. 4,547,143, Cl. 425-447.000.

Chambers, James V.; Perry, T. Wayne; Lonergan, Dennis A.; and Marks, Jay S., to Purdue Research Foundation. Lactose/cheese whey/whey filtrate semi-solid animal feed supplement. 4,547,386, Cl. 426-583.000.

Champion International Corporation: *See—*
Roccaforte, Harry I., 4,546,914, Cl. 229-52.00B.

Champion Laboratories, Inc.: *See—*
Gaither, John D., 4,547,287, Cl. 210-149.000.

Chan, Woontung G., to Philip Morris Incorporated. 3-O-(3-p-Methylphenyl-3-oxo)propionyl glucopyranose and related compounds. 4,547,568, Cl. 536-18.200.

Chance, Peter E.; and Weiss, Mitchell, to United States Robots, Inc. Robotic manipulator arm. 4,547,119, Cl. 414-735.000.

Chang, Biau-Hung, to Ashland Oil, Inc. Method of reactivating Group VIII anionic hydroformylation catalysts. 4,547,595, Cl. 568-454.000.

Chang, Eugene Y. C., to American Cyanamid Company. Catalyst systems for polyurethane compositions. 4,547,478, Cl. 502-154.000.

Chapell, Harry F., to Sage Laboratories, Inc. Microwave coupler. 4,547,753, Cl. 333-115.000.

Chaplin, Eric: *See—*
Tanner, Peter R.; and Chaplin, Eric, 4,547,030, Cl. 339-21.00R.

Charbonnet, Carl D. Apparatus for transporting and aligning panel-like members. 4,547,115, Cl. 414-121.000.

Chase, James W.: *See—*
Worns, John R.; Chase, James W.; and Capriotti, Bruce W., 4,547,453, Cl. 430-271.000.

Chaudot, Gerard. System for preventing liquids from being driven to the flair stack tip. 4,547,149, Cl. 431-202.000.

Chemie Und Filter GmbH, Verfahrenstechnik KG: *See—*
Edler, Friedrich, 4,547,680, Cl. 307-141.000.

Chemische Werke Huls Aktiengesellschaft: *See—*
Gude, Fritz; and Haferkorn, Herbert, 4,547,578, Cl. 549-250.000.

Chen, Augustin T.; and Onder, Kemal, to Dow Chemical Company, The. Polymer blends. 4,547,547, Cl. 524-538.000.

Chen, Dan Y., to United States of America, National Aeronautics and Space Administration. Hybrid power semiconductor switch. 4,547,686, Cl. 307-570.000.

Chenebault, Philippe: *See—*
Vallin, Didier; Grassien, Jean-Yves; Chenebault, Philippe; and Kerouanton, Alain, 4,547,441, Cl. 429-196.000.

Chermann, Jean-Claude; Jasmin, Claude; and Mathe, Georges, to Cabinet Harle & Phelip. Antiviral agent. 4,547,369, Cl. 424-131.000.

Cherney, Dale M., to Hayssen Manufacturing Company. Method of and apparatus for forming, filling and sealing packages. 4,546,596, Cl. 53-451.000.

Cherry Electrical Products Corporation: *See—*
Leger, Raymond A., 4,547,634, Cl. 200-50.00C.

Cheung, Yin L.: *See—*
Long, Stephen L.; Cheung, Yin L.; and Brown, Alfred, 4,547,078, Cl. 374-42.000.

Chevron Research Company: *See—*
Van Nordstrand, Robert A., 4,547,472, Cl. 502-66.000.

Childers, Jimmie D.; and Hyslop, Adin E., to Texas Instruments Incorporated. Dummy-cell circuitry for dynamic read/write memory. 4,547,868, Cl. 365-203.000.

Childers, John S.; and Pastusek, Paul E., to Reed Tool Company. Drill bit having angled nozzles for improved bit and well bore cleaning. 4,546,837, Cl. 175-340.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See*—
Fenyvesi, Eva; Szejtli, Jozsef; Zsadon, Bela; Antal, Balazs; and Wagner nee Kohary, Ildiko , 4,547,572, Cl. 536-103.000.

Chloe Chimie: *See*—
Bachot, Jean; Quentin, Jean-Pierre; and Bourgeois, Jean-Luc, 4,547,411, Cl. 427-393.500.

Cholod, Michael S., to Rohm and Haas Company. Copolyester of polyethylene terephthalate and bis (4-beta hydroxy ethoxy phenyl) sulfone. 4,547,563, Cl. 528-173.000.

Chono, Masazumi: *See*—
Fukuoka, Shinsuke; Chono, Masazumi; Watanabe, Tomonari; and Kohno, Masashi, 4,547,322, Cl. 260-453.00P.

Chow, Kwong-Wai: *See*—
Lee, James S. W.; Chow, Kwong-Wai; Lau, Alfred T. Y.; and Chow, Ming-Ngar, 4,547,174, Cl. 446-463.000.

Chow, Ming-Ngar: *See*—
Lee, James S. W.; Chow, Kwong-Wai; Lau, Alfred T. Y.; and Chow, Ming-Ngar, 4,547,174, Cl. 446-463.000.

Christian, David E.: *See*—
McGraw, Cobern E.; Gazzero, Robert; and Christian, David E., 4,547,813, Cl. 358-285.000.

Christian, Donald K.: *See*—
Terry, David E.; and Christian, Donald K., 4,546,867, Cl. 194-1.00D.

Chrysler Corporation: *See*—
Litner, Richard C., 4,546,850, Cl. 181-141.000.
Secord, Nelson W., 4,546,666, Cl. 74-501.00P.

Church & Dwight Co., Inc.: *See*—
Winston, Anthony; Ansaldi, Anthony; and Usen, Norman, 4,547,362, Cl. 424-49.000.

Churchland, Mark T.; and Schilling, Walter W., to MacMillan Bloedel Limited. Method and apparatus for sorting elongate articles. 4,546,886, Cl. 209-665.000.

Ciabatti, Romeo: *See*—
Guzzi, Umberto; and Ciabatti, Romeo, 4,547,521, Cl. 514-530.000.

Ciba Geigy Corporation: *See*—
Bohner, Beat, 4,547,216, Cl. 71-93.000.
Malherbe, Roger F.; and Ackerman, Michael H., 4,547,537, Cl. 524-97.000.
Mockli, Peter, 4,547,579, Cl. 549-280.000.
Spivack, John D.; and Pastor, Stephen D., 4,547,539, Cl. 524-112.000.
Tzikas, Athanassios, 4,547,575, Cl. 546-30.000.

Ciba-Geigy S.p.A.: *See*—
Cantatore, Giuseppe, 4,547,548, Cl. 525-186.000.

Cicci, George B.; and Guldberg, Erik J., to Paul Revere Corporation, The. Roll opener for a mower conditioner. 4,546,599, Cl. 56-16.400.

Cincinnati Milacron Inc.: *See*—
Hallbach, Raymond L.; and Reynolds, John S., 4,546,533, Cl. 29-568.000.

Cissell Manufacturing Company: *See*—
Bullock, Norman J.; Barnett, Paul F.; and Lattis, Donald J., 4,546,554, Cl. 34-48.000.

Citizen Watch Co., Ltd.: *See*—
Shiba, Kazuo; and Fuwa, Shigehiro, 4,546,573, Cl. 51-165.720.

Clapham, Edward F.: *See*—
Moore, Alan; Harman, Geoffrey E.; Rosser, David G.; and Clapham, Edward F., 4,546,604, Cl. 60-39.093.

Clark, Lonel L.; and Ellefson, Ronald H. Method for providing a tool for forming an article. 4,546,674, Cl. 76-107.00R.

Clark, Michael G., to National Research Development Corporation. Character display panels and panel devices. 4,547,773, Cl. 340-765.000.

Clark Rubber Limited: *See*—
Meyers, Graham J.; Hudson, Barry L.; and Berry, Desmond J., 4,546,787, Cl. 137-119.000.

Clauss, Gerhard, to Michael Hoerauf Maschinenfabrik GmbH & Co KG. Heat-sealable coated paper container and method of manufacture. 4,546,911, Cl. 229-5.600.

Clayton, William J., to Mobil Oil Corporation. Scouring pad and method for producing same. 4,546,515, Cl. 15-209.00C.

Clements, Jack W.: *See*—
Lanyi, William D.; and Clements, Jack W., 4,547,855, Cl. 364-474.000.

Clements-Jewery, Stephen: *See*—
Rowlands, David A.; Gillespie, Roger J.; Ager, Ian R.; Clements-Jewery, Stephen; and Gardner, Colin R., 4,547,507, Cl. 514-291.000.

Clements, Reginald M.; Ridley, John D.; and Pitt, Philip L., to University of Victoria. Ignition source for internal combustion engine. 4,546,740, Cl. 123-304.000.

Cleveland, Donald S.: *See*—
Weber, Harold J.; Kuehnle, Manfred R.; Compton, James C.; Poulakis, John N.; Szymanski, Michael J.; Lindblom, Kenneth A.; and Cleveland, Donald S., 4,547,061, Cl. 355-10.000.

Clough, Thomas J.: *See*—
Rowlette, John J.; Clough, Thomas J.; Josefowicz, Jack Y.; and Sibert, John W., 4,547,443, Cl. 429-217.000.

Coburn Optical Industries, Inc.: *See*—
Tusinski, Joseph; Hill, Phillip D.; and Griffith, John M., 4,547,242, Cl. 156-105.000.

Cocain, Harry W.: *See*—
Melby, Earl G.; Fabris, Hubert J.; Livigni, Russell A.; and Cocain, Harry W., 4,547,550, Cl. 525-205.000.

Cogo, Bruno. Device for transporting and positioning dough triangles in crescent shaped dough rolls forming machines. 4,546,870, Cl. 198-400.000.

Cogsdill Tool Products, Inc.: *See*—
Millington, Douglas; and Yewman, Peter W. W., 4,547,102, Cl. 408-185.000.

Coherent, Inc.: *See*—
Allen, Peter N.; and Blake, William, 4,547,885, Cl. 372-58.000.

Cohn, David B.; and Komine, Hiroshi, to Northrop Corporation. Long pulse laser with sequential excitation. 4,547,883, Cl. 372-25.000.

Cohn, Robert J., to InterMetro Industries Corporation. System for supporting cylindrical articles, such as wine bottles, in bulk. 4,546,887, Cl. 211-49.100.

Colardelle, Joel S. G., to International Standard Electric Corporation. Integrated circuit three-input binary adder cell with high-speed sum propagation. 4,547,863, Cl. 364-784.000.

Coles, Russell I.; Griest, Norman J.; Marando, Raoul J.; and Suleske, Aaron A., to United States of America, Navy. Ship deck lifeline. 4,547,164, Cl. 441-84.000.

Colgate, Gilbert, Jr., to U.S. Banknote Corporation. Credit and identification cards having pieces of diffraction grating therein. 4,547,002, Cl. 283-91.000.

Colgate-Palmolive Company: *See*—
Hendrickson, Thomas C., 4,547,237, Cl. 156-70.000.
Steltenkamp, Robert J.; Douglass, Miriam L.; and Natarelli, Gerard E., 4,547,361, Cl. 424-49.000.

Collender, Robert B. Stereoscopic pictures by rotating projectors. 4,547,050, Cl. 352-43.000.

Collins, Floyd K.: *See*—
Burdick, Glen A.; Collins, Floyd K.; and Kuryla, Alan T., 4,547,697, Cl. 313-412.000.

Collins, Geoff; and Juurmaa, Kimmo, to Oy Wartsila Ab. Arrangement in vessels. 4,546,719, Cl. 114-40.000.

Colt Industries Operating Corp: *See*—
Corrette, Richard H., 4,546,639, Cl. 72-469.000.

Colyer, Timothy D., to Armstrong World Industries, Inc. Method for making decorative laminate. 4,547,245, Cl. 156-220.000.

Combe, Michel: *See*—
Hamelin, Jean-Francois; and Combe, Michel, 4,547,879, Cl. 370-86.000.

Comdial Technology Corporation: *See*—
Corless, Robert W., 4,547,629, Cl. 179-81.00R.

Commissariat a l'Energie Atomique: *See*—
Genies, Eugene, 4,547,439, Cl. 429-105.000.
Laviron, Andre ; and Berard, Claude, 4,547,861, Cl. 364-715.000.
Potard, Claude, 4,546,811, Cl. 164-66.100.

Compton, James C.: *See*—
Weber, Harold J.; Kuehnle, Manfred R.; Compton, James C.; Poulakis, John N.; Szymanski, Michael J.; Lindblom, Kenneth A.; and Cleveland, Donald S., 4,547,061, Cl. 355-10.000.

Connolly, John C.: *See*—
Botez, Dan; and Connolly, John C., 4,547,396, Cl. 427-87.000.

Consiglio Nazionale Delle Ricerche: *See*—
Picchi, Giorgio; and Prati, Giancarlo, 4,547,889, Cl. 375-15.000.

Container Corporation of America: *See*—
Desmond, John D., 4,546,912, Cl. 229-30.000.

Cook, John E.; Hagerty, Robert O.; and Jacob, Frederick W., to Mobil Oil Corporation. Method for rapid kill gas injection to gas phase polymerization reactors during power failures. 4,547,555, Cl. 526-60.000.

Cook, Richard A.: *See*—
Weis, Philip J.; and Cook, Richard A., 4,546,661, Cl. 74-15.400.

Cool, Steven L.: *See*—
Richey, Joseph B.; Wake, Robert H.; Walters, Ronald G.; Hunt, Willard F.; and Cool, Steven L., 4,547,892, Cl. 378-8.000.

Copeland Corporation: *See*—
Riffe, Delmar R.; Elson, John P.; Sathe, Dilip S.; and Grassbaugh, Walter T., 4,547,131, Cl. 417-53.000.

Cordella, Johannes: *See*—
Scheurecker, Werner; Scheinecker, Alois; Cordella, Johannes; and Engel, Kurt, 4,546,547, Cl. 33-182.000.

Corless, Robert W., to Comdial Technology Corporation. Energy management circuit. 4,547,629, Cl. 179-81.00R.

Cormary, Yves; and Nicolas, Christian, to Service National Electricite de France. Temperature and hygrometry control and regulation interface. 4,546,917, Cl. 236-44.00C.

Cornelissen, Johannes M.; Lagerwaard, Cornelis A.; and Martens, Rudolf J., to Lever Brothers Company. Low temperature bleaching detergent compositions comprising peracids and persalt activator. 4,547,305, Cl. 252-94.000.

Cornwell, Dean F., to United Technologies Corporation. Noninterference optical error sensing system. 4,547,662, Cl. 250-201.000.

Corrente, Russell J. Wearable fishing rod holder. 4,546,566, Cl. 43-21.200.

Corrette, Richard H., to Colt Industries Operating Corp. Thread rolling dies for forming self tapping screws and the like. 4,546,639, Cl. 72-469.000.

Cosimati, Robert O. Chili pepper harvester. 4,546,602, Cl. 56-327.00R.

Cosyns, Jean; and Boitiaux, Jean-Paul, to Societe Francaise des Produits pour Catalyse Pro-Catalyse. Process for selectively hydrogenating acetylenic hydrocarbons of a C_4 hydrocarbon cut containing butadiene. 4,547,600, Cl. 585-259.000.

Cotie, Robert L., to C & H Contact Lens Inc. Composite ophthalmic lens system. 4,547,049, Cl. 351-159.000.

Coulter Systems Corporation: *See*—
Weber, Harold J.; Kuehnle, Manfred R.; Compton, James C.; Poulakis, John N.; Szymanski, Michael J.; Lindblom, Kenneth A.; and Cleveland, Donald S., 4,547,061, Cl. 355-10.000.

Couput, Francis, to Cebal. Plastic sealing screw cap with improved tamper-proof strip. 4,546,892, Cl. 215-252.000.

Coutts, Richard D. Continuous passive motion method and apparatus. 4,546,763, Cl. 128-25.00R.

Covey, Joel P.; and Vidrine, D. Warren. Optical analytical instrument beam condenser. 4,547,068, Cl. 356-244.000.

Credfeld Camtorc Limited: *See*—
McCormack, Wallace, 4,546,921, Cl. 239-125.000.

Cremer, Jens, to Euronom AB. Burner head. 4,546,710, Cl. 110-263.000.

Critikon: *See*—
Schlessinger, Joseph E.; and Hamilton, Richard G., 4,546,770, Cl. 128-630.000.

Critikon, Inc.: *See*—
Medero, Richard, 4,546,775, Cl. 128-681.000.
Sullivan, Richard E., 4,546,778, Cl. 128-718.000.

Croll-Reynolds Engineering Co., Inc.: *See*—
Sim, F. Thomas; Ancillai, Louis D.; and Leikam, Carson, 4,547,296, Cl. 210-778.000.

Cronin, Michael J., to Lockheed Corporation. Energy efficient ECS powered by a variable voltage/variable frequency power system. 4,546,939, Cl. 244-118.500.

Cross Company, The: *See*—
Menzel, Klaus R., 4,546,834, Cl. 173-146.000.

Cross, Peter E.: *See*—
Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., 4,547,502, Cl. 514-253.000.

Crossley, Roger, to John Wyeth & Brother Ltd. 8-Benzylidene-5,6,7,8-tetrahydroquinoline derivatives. 4,547,510, Cl. 514-311.000.

Crowley, George C., to Sunbeam Corporation. Multiple heat fusing wire circuit for underblankets. 4,547,658, Cl. 219-539.000.

Crowley, Patrick J.; and Williams, John C., to Imperial Chemical Industries PLC. Pesticidally active azolyl-hydroxy alkanones. 4,547,214, Cl. 71-76.000.

Crown Zellerbach Corporation: *See*—
Lane, Stanley C., 4,547,349, Cl. 423-164.000.

Cuccio, Anthony. Holder for musical instruments. 4,546,688, Cl. 84-327.000.

Cullen, Walter P.: *See*—
Celmer, Walter D.; Cullen, Walter P.; Maeda, Hiroshi; and Tone, Junsuke, 4,547,523, Cl. 514-375.000.

Cummins, Robert P., to Fargo Electronic Services Inc. Printer with manual paper feed and weigh scale incorporating the same. 4,547,780, Cl. 346-9.000.

Cummins, William T.; and Lobdell, Wallace A., to Teledyne Industries Inc. Passenger vehicle spare tire construction. 4,546,807, Cl. 152-41.000.

Cunningham, Donald J.: *See*—
Adams, Gary V.; Ahlf, Wilbur J.; Cunningham, Donald J.; and Dahle, David P., 4,547,342, Cl. 422-166.000.

Cunningham, Douglas J., to Britax (Wingard) Limited. Clamping means for a strap. 4,547,018, Cl. 297-483.000.

Cutler, Raymond A.: *See*—
Jones, Arfon H.; and Cutler, Raymond A., 4,547,468, Cl. 501-33.000.

Cybar Corporation: *See*—
Sanderford, Dorsey W., 4,546,785, Cl. 137-85.000.

Cypress Group Limited, The: *See*—
Reid, Gilbert M., 4,546,896, Cl. 220-4.00F.

Czanderna, Alvin W.: *See*—
Pitts, John R.; Thomas, Terence M.; and Czanderna, Alvin W., 4,547,432, Cl. 428-448.000.

Dahle, David P.: *See*—
Adams, Gary V.; Ahlf, Wilbur J.; Cunningham, Donald J.; and Dahle, David P., 4,547,342, Cl. 422-166.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Murayama, Kosho, 4,547,250, Cl. 156-384.000.

Daigle, Verlon C.; and Smith, Wayne R., to McDermott International, Inc. Alignment of tubular piles for joinder. 4,547,096, Cl. 405-251.000.

Daikin Kogyo Company Limited: *See*—
Iwatsuki, Shouji, 4,547,558, Cl. 526-245.000.
Sako, Junichi; and Honda, Norimasa, 4,547,311, Cl. 252-511.000.

Daimler-Benz Aktiengesellschaft: *See*—
Spaude, Heinz-Werner, 4,547,734, Cl. 324-395.000.

Dainippon Screen Seizo Kabushiki Kaisha: *See*—
Hirosawa, Makoto, 4,547,814, Cl. 358-298.000.

Dakin, R.: *See*—
Segan, Marc C.; Swarztrauber, Sayre A.; and Patterson, Neil K., 4,547,635, Cl. 200-52.00R.

Dalli, Alan G.: *See*—
Debenham, Michael; Dalli, Alan G.; and Revill, Peter L., 4,546,873, Cl. 198-836.000.

Dana Corporation: *See*—
Weis, Philip J.; and Cook, Richard A., 4,546,661, Cl. 74-15.400.

Danfoss A/S: *See*—
Beierholm, Hans M.; and Thun, Niels, 4,547,842, Cl. 363-35.000.
Vind, Holger V., 4,547,825, Cl. 361-22.000.

Daniels, Richard J.: *See*—
Bialas, John S., Jr.; Daniels, Richard J.; and Mruk, William J., 4,547,682, Cl. 307-297.000.

Daniels, Ted M.: *See*—
Little, William R.; and Daniels, Ted M., 4,547,665, Cl. 250-227.000.

Dassler, Armin A., to Puma-Sportschuhfabriken Rudolf Dassler KG. Athletic shoe for track and field use. 4,546,559, Cl. 36-129.000.

Dataproducts Corporation: *See*—
Cassese, Samuel E.; and Marquez, Walter, 4,546,908, Cl. 226-74.000.

Daughton, William J., to Mead Corporation, The. Method of preparing an orifice plate for an ink jet printer. 4,547,330, Cl. 264-261.000.

Davenport, John M.: *See*—
Brinn, Walter K.; Berlec, Ivan; Davenport, John M.; Vukcevich, Milan R.; and Fridrich, Elmer G., 4,547,704, Cl. 315-71.000.

David, Constant V. Dice and games. 4,546,978, Cl. 273-146.000.

David, Stephen T.; Brooke, Dana; and Gallian, Claude E., to Mead Johnson & Company. Sustained release tablet containing at least 95 percent theophylline. 4,547,358, Cl. 424-14.000.

Davidson, Alvin L., to Guy E. Lane. Oil well drilling rig assembly and apparatus therefor. 4,547,110, Cl. 414-22.000.

Davis, Dhu Aine J., to Illinois Precision Corporation. Rotary injection molding press. 4,547,140, Cl. 425-138.000.

Dawson, C. Bruce, to O'Sullivan Corporation. Method and apparatus for coiling a continuous string of molded items about a vertical axis. 4,546,931, Cl. 242-67.200.

Daykin, Theodore W.: *See*—
Grider, Duane M.; and Daykin, Theodore W., 4,546,741, Cl. 123-337.000.

Dean, Robert; Reyner, Peter J.; and Heiman, Frederic P., to Mars Incorporated. Coin testing apparatus. 4,546,869, Cl. 194-99.000.

Debenham, Michael; Dalli, Alan G.; and Revill, Peter L., to Broken Hill Proprietary Company Limited, The. Article retention system for transfer equipment. 4,546,873, Cl. 198-836.000.

DeBoo, Robert V.: *See*—
Viriyayuthakorn, Montri; and DeBoo, Robert V., 4,547,246, Cl. 156-244.120.

Deck, Charles F.; and Carson, James E., to BASF Wyandotte Corporation. Water-based functional fluids thickened by the interaction of an associative polyether thickener and certain quaternary ammonium salts. 4,547,303, Cl. 252-73.000.

Decolvenaer, Etienne K. A.: *See*—
Pansaerts, Marcel F. R.; Bogaert, Joseph M. F.; and Decolvenaer, Etienne K. A., 4,547,835, Cl. 361-399.000.

Deegan, Dennis I.: *See*—
DeMarco, Richard E.; Hopkins, David; and Deegan, Dennis I., 4,547,417, Cl. 428-64.000.

Deeter, Wayne R.: *See*—
De Vita, Joseph P.; Mulder, Thomas J.; O'Mohundro, Kenneth J.; Wellington, Leslie J.; Deeter, Wayne R.; and Sternaman, Larry D., 4,547,880, Cl. 370-91.000.

Degenford, James E.: *See*—
Freitag, Ronald G.; Degenford, James E.; and Boire, Daniel C., 4,547,745, Cl. 330-286.000.

Degussa Aktiengesellschaft: *See*—
Oepen, Gerhard; Engel, Jurgen; Jakovlev, Vladimir; and Thiemer, Klaus, 4,547,505, Cl. 514-255.000.

De Kraker, James E.: *See*—
Houle, Raymond T.; Kilbourn, Frederick A.; De Kraker, James E.; and Nilsson, Robert T., 4,546,506, Cl. 4-555.000.

Delakowitz, Bernd: *See*—
Forberg, Horst; and Delakowitz, Bernd, 4,547,034, Cl. 339-97.00P.

Delkor Industries, Inc.: *See*—
Mohaupt, John M., 4,546,594, Cl. 53-447.000.

Delmulle, Jean P.; and Torchet, Bernard, to L'Etat Francais represente par le Ministere de l'Urbanisme et du Logement, Laboratoire Central des Ponts et Chaussees. Measuring device for the moisture content of granular materials. 4,546,645, Cl. 73-74.000.

Delzant, Marcel, to Glaverbel. Gas-filled glass beads and method of making. 4,547,233, Cl. 149-2.000.

DeMarco, Richard E.; Hopkins, David; and Deegan, Dennis I., to Westvaco Corporation. Core plug. 4,547,417, Cl. 428-64.000.

Denker, Stanley D., to Doboy Packaging Machinery, Inc. Transfer assembly for literature wrapping equipment. 4,546,597, Cl. 53-540.000.

Denki Onkyo Company Limited: *See*—
Yabase, Koji, 4,547,707, Cl. 315-368.000.

Dennis, James G.; Bramlett, Kenneth W.; and Jackson, G. C., Jr., to Dresser Industries, Inc. Downhole motor fluid flow restrictor. 4,546,836, Cl. 175-107.000.

Deraedt, Roger: *See*—
Teutsch, Jean-Georges; Torelli, Vesperto; Deraedt, Roger; and Philibert, Daniel, 4,547,493, Cl. 514-179.000.

Deserdein, Incorporated: *See*—
Ison, Deborah K., 4,546,508, Cl. 5-494.000.

Desmond, John D., to Container Corporation of America. Carton lid with rounded corners. 4,546,912, Cl. 229-30.000.

Dessau, Ralph M., to Mobil Oil Corporation. Multi-stage process for the conversion of olefins into high viscosity lubricants. 4,547,609, Cl. 585-517.000.

Detector Electronics Corporation: *See*—
Larsen, Theodore E.; and Juaire, Michael P., 4,547,673, Cl. 250-554.000.

Dettmer, Dennis G.: *See*—
Snyder, Walter W.; and Dettmer, Dennis G., 4,546,636, Cl. 72-346.000.

De Vita, Joseph P.; Mulder, Thomas J.; O'Mohundro, Kenneth J.; Wellington, Leslie J.; Deeter, Wayne R.; and Sternaman, Larry D., to Able Computer. Communication control apparatus for digital devices. 4,547,880, Cl. 370-91.000.

Diaz, Zaida, to Shell Oil Company. Process for removal of phenolic inhibitors from polymerizable conjugated olefin. 4,547,619, Cl. 585-824.000.
Dick, David A.: *See*—
Reed, Leonard W.; Barr, Robert M. S.; and Dick, David A., 4,547,416, Cl. 428-36.000.
Dickenson, Alfred J., to Moray Industries Limited. Garments and/or methods of protecting garments. 4,546,492, Cl. 2-46.000.
Dictaphone Corporation: *See*—
Rutkowski, Richard G.; Dwyer, John J.; and Hoover, John W., 4,547,821, Cl. 360-75.000.
Diefenbach, Horst: *See*—
Geist, Michael; and Diefenbach, Horst, 4,547,409, Cl. 427-386.000.
Diekman, Robert L.: *See*—
Allen, David A.; and Diekman, Robert L., 4,546,991, Cl. 280-282.000.
Diesel Kiki Co., Ltd.: *See*—
Moriya, Kouichi; Iwata, Kouki; and Takefuts, Hideyasu, 4,546,736, Cl. 123-179.00G.
Nakajima, Nobuyuki; and Yamada, Keiichi, 4,546,739, Cl. 123-299.000.
Suzuki, Nobuhiko; and Sasaki, Masaya, 4,546,617, Cl. 62-180.000.
Dietiker, Paul; Olson, Elwyn H.; and Torborg, Ralph H., to Honeywell Inc. Fuel gas control. 4,547,144, Cl. 431-20.000.
Dietrich, William J., Sr.; and Sizelove, Cary L., to DMI, Inc. Agricultural implement with spring cushion for vertically adjustable subframe. 4,546,832, Cl. 172-260.500.
Diffracto Ltd.: *See*—
Pryor, Timothy R.; Hageniers, Omer L.; and North, Walter P. T., 4,547,674, Cl. 250-560.000.
Diller, Calvin D.: *See*—
Beazley, Todd M.; and Diller, Calvin D., 4,547,724, Cl. 324-57.00R.
Dinnissen, Johannes H. A., to Oce-Nederland B.V. Sheet separation apparatus. 4,546,963, Cl. 271-35.000.
di Ricco, Leo; Schnee, Edward; Stefanini, Zorro; and Frew, Duncan W., to Memorex Corporation. Method to disperse fine solids without size reduction. 4,547,534, Cl. 523-324.000.
Diversified Products Corporation: *See*—
Silberman, Ira J., 4,546,968, Cl. 272-117.000.
Divilio, Franklin D.; and Woda, Daniel G. Multiple piece catalytic converter flange. 4,547,344, Cl. 422-310.000.
Dixon, Weldon R.: *See*—
Watrous, Howard N.; Cash, Walter, Jr.; and Dixon, Weldon R., 4,547,114, Cl. 414-81.000.
DMI, Inc.: *See*—
Dietrich, William J., Sr.; and Sizelove, Cary L., 4,546,832, Cl. 172-260.500.
Doboy Packaging Machinery, Inc.: *See*—
Denker, Stanley D., 4,546,597, Cl. 53-540.000.
Dr. Alberto Ciampolini Strumenti Scientifici: *See*—
Fei, Alberto, 4,547,075, Cl. 356-440.000.
Doherty, James B.; Ashe, Bonnie M.; Finke, Paul E.; Shah, Shrenik K.; Thompson, Kevan R.; and Zimmerman, Morris, to Merck & Co., Inc. Substituted cephalosporin sulfones as anti-inflammatory and anti-degenerative agents. 4,547,371, Cl. 514-200.000.
Dombroski, John R.; Hawkins, J. Maynard; Pollock, Mark A.; Leonard, Alan P.; and Mitchell, Thomas A., to Eastman Kodak Company. Process for forming copolymer particles. 4,547,329, Cl. 264-118.000.
Domnanovich, James R.: *See*—
Groch, Mark W.; and Domnanovich, James R., 4,546,777, Cl. 128-715.000.
Don Mowry Flexo Parts, Inc.: *See*—
Mowry, Donald E., 4,547,183, Cl. 493-182.000.
Donahue, Lawrence E.: *See*—
Alamprese, Leo; and Donahue, Lawrence E., 4,547,079, Cl. 374-116.000.
Doin Incorporated: *See*—
Mieyal, David F.; and Reynard, Peter, 4,546,584, Cl. 52-281.000.
Donohue, John A.: *See*—
Turnbull, Lennox B.; Donohue, John A.; and Jagdmann, Gunnar E., Jr., 4,547,518, Cl. 514-403.000.
Doring, Joachim: *See*—
Zabrocki, Karl; Tiburtius, Christoph; Doring, Joachim; and Richter, Klaus, 4,547,533, Cl. 523-206.000.
Dornier, Peter, to Lindauer Dornier Gesellschaft mbH. Relief means for the drive mechanisms of components alternatingly rocking between two end positions. 4,546,803, Cl. 139-449.000.
Dorony, Elmer F.: *See*—
French, Robert J.; and Dorony, Elmer F., 4,547,026, Cl. 312-201.000.
Dorow, Joachim, to Albert-Frankenthal AG. Apparatus for holding printing plates on the cylinder of a printing press. 4,546,702, Cl. 101-415.100.
Douglass, Miriam L.: *See*—
Steltenkamp, Robert J.; Douglass, Miriam L.; and Natarelli, Gerard E., 4,547,361, Cl. 424-49.000.
Dow Chemical Company, The: *See*—
Chen, Augustin T.; and Onder, Kemal, 4,547,547, Cl. 524-538.000.
Garner, Joseph L., 4,547,570, Cl. 536-84.000.
Gatlin, Janice E.; VanDort, Mark A.; and Volkmann, Curtis L., 4,547,577, Cl. 546-345.000.
Glass, Sarah M.; and Edmondson, Morris S., 4,547,475, Cl. 502-115.000.
Louks, David H.; Thompson, Leonard R.; and Muench, Wayne C., 4,547,597, Cl. 568-779.000.
Malhotra, Sudarshan K.; and Gerwick, B. Clifford, III, 4,547,218, Cl. 71-94.000.
McCreedy, Kathleen M.; Pawloski, James C.; Keskkula, Henno; and Yonkers, Edward H., 4,547,530, Cl. 521-139.000.
Dow Corning Corporation: *See*—
Graiver, Daniel; and Kalinowski, Robert E., 4,547,312, Cl. 252-513.000.
Lee, Chi-Long; and Rabe, James A., 4,547,529, Cl. 521-122.000.
Dowdakin, William J., Sr. Self-aligning tool holder. 4,547,101, Cl. 408-127.000.
Downs, Robert E.; and Schwallie, Ambrose L., to United States of America, Energy. Fuel rod support grid. 4,547,335, Cl. 376-442.000.
Drapp, Joseph W. Transformer structure. 4,547,721, Cl. 323-355.000.
Dreiling, Peter M., to Hi-Lite Polishing Machine Co. Inc. Polishing apparatus having an expandable head. 4,546,576, Cl. 51-372.000.
Dresser Industries, Inc.: *See*—
Dennis, James G.; Bramlett, Kenneth W.; and Jackson, G. C., Jr., 4,546,836, Cl. 175-107.000.
Stauffer, Robert E., 4,546,844, Cl. 180-243.000.
Driskell, Thomas D., to Miter, Inc. Submergible post-type dental implant system and method of using same. 4,547,157, Cl. 433-173.000.
Drozd, Edward J., Jr., to Captive Plastics, Inc. Method of forming tamper evident closures. 4,547,332, Cl. 264-339.000.
Drucker, Alan S., to Carrier Corporation. Heat pump charge optimizer. 4,546,616, Cl. 62-174.000.
Du Pont Canada Inc.: *See*—
Hamilton, Michael A.; and Zboril, Vaclav G., 4,547,473, Cl. 502-113.000.
Dubuc, Luc, to Placages Nicolet-Sud Inc. Method for trimming the edges of a sheet of veneer perpendicularly to its grain while preventing this sheet from splitting. 4,546,806, Cl. 144-345.000.
Ducellier & Cie: *See*—
Pierret, Jean M., 4,546,753, Cl. 123-634.000.
Dudzik, Joachim; and Dudzik, Winfried. Sensor for label transporting equipment. 4,547,249, Cl. 156-363.000.
Dudzik, Winfried: *See*—
Dudzik, Joachim; and Dudzik, Winfried, 4,547,249, Cl. 156-363.000.
Duke, Billy M., to Harris Corporation. Gap maker. 4,546,871, Cl. 198-425.000.
Dumont, Bernard; Proponet, Christian; Bancelin, Bernard; Brucker, Roland; Bories, Jean-Louis; and Klein, Christiane, to Thomson-CSF. Structure for assembling complex electronic circuits. 4,547,834, Cl. 361-386.000.
Dumortier, Thierry M., to Fabrique Nationale Herstal. Connecting device between the wishbone and the mast of a sailboard. 4,546,720, Cl. 114-98.000.
Dunbar, Sidney G., to Owens-Corning Fiberglas Corporation. Highly dispersed continuous glass fiber mats. 4,547,421, Cl. 428-285.000.
Dunegan, Luther H.: *See*—
Stone, Richard J.; Dunegan, Luther H.; and Smith, George E., 4,546,640, Cl. 73-19.000.
Dunn, James C.; Hardee, Harry C.; and Striker, Richard P., to United States of America, Energy. Convective heat flow probe. 4,547,080, Cl. 374-135.000.
Duperon, Terry. Adjustable spirit level construction. 4,546,549, Cl. 33-334.000.
Du Pont de Nemours, E. I., and Company: *See*—
Grubb, Eugene L.; and Matrick, Howard, 4,547,457, Cl. 430-449.000.
Rellick, Joseph R., 4,547,436, Cl. 428-672.000.
Shapiro, Rafael, 4,547,217, Cl. 71-93.000.
Wolf, Anthony D., 4,547,215, Cl. 71-92.000.
Duracell Inc.: *See*—
McArthur, William J.; and Kelm, Roger W., 4,547,438, Cl. 429-82.000.
Dusel, Robert O.; and Blaha, Gerald E., to Artos Engineering Company. Apparatus for axially shifting wire segments in belt type conveyor. 4,546,526, Cl. 29-33.00M.
Duterque, Jean-Paul: *See*—
Lussiez, Guy W.; Duterque, Jean-Paul; and Polkinghorn, Thomas W., 4,547,348, Cl. 423-150.000.
Duz-Mor, Inc.: *See*—
Field, Carl R., 4,546,638, Cl. 72-455.000.
Dvorsky, Drahomir; and Cerovsky, Karel, to Vyzkumny ustav zuslechtovaci. Quaternary pyrazinium compounds. 4,547,574, Cl. 544-336.000.
Dwyer, John J.: *See*—
Rutkowski, Richard G.; Dwyer, John J.; and Hoover, John W., 4,547,821, Cl. 360-75.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Ballreich, Kurt; Jensen, Ernst; and Knappworst, Jurgen, 4,546,704, Cl. 102-444.000.
Dynatek, Inc.: *See*—
Swanson, Wilbur M., 4,546,642, Cl. 73-37.000.
E-Zee Company: *See*—
Thompson, Joseph V., Jr., 4,546,569, Cl. 43-57.300.
Eacobacci, Michael J.; and Olsen, Donald A., to Helix Technology Corporation. Cryopump with rapid cooldown and increased pressure. 4,546,613, Cl. 62-55.500.
Eastman, George Y., to Thermacore, Inc. Capillary input for pumps. 4,547,130, Cl. 417-53.000.
Eastman Kodak Company: *See*—
Alexandrovich, Peter S.; Sorriero, Louis J.; and Sreekumar, Chandra, 4,547,449, Cl. 430-115.000.
Baumeister, Hans-Peter, 4,547,056, Cl. 354-412.000.

Bridges, Mark E., 4,547,054, Cl. 354-268.000.
Dombroski, John R.; Hawkins, J. Maynard; Pollock, Mark A.; Leonard, Alan P.; and Mitchell, Thomas A., 4,547,329, Cl. 264-118.000.
Eikenberry, Jon N., 4,547,460, Cl. 435-15.000.
Eikenberry, Jon N., 4,547,465, Cl. 436-170.000.
Esders, Theodore W.; Lynn, Shirley Y.; Findlay, John B.; and Schubert, Richard M., 4,547,461, Cl. 435-17.000.
Peffer, Robert M., 4,547,058, Cl. 355-3.0SH.

Eaton Corporation: *See—*
Larson, Jay M.; Jenkins, Lawrence F.; and Belmore, James E., 4,547,229, Cl. 148-134.000.

Ebata, Shuji: *See—*
Osugi, Minoru; Nakamura, Tadasi; and Ebata, Shuji, 4,547,482, Cl. 502-208.000.

Ebernard, Franck, to Kraftwerk Union Aktiengesellschaft. Solar-tower power station. 4,546,758, Cl. 126-451.000.

Ebihara, Yoshiyuki, to Etona, Co., Ltd. Stapler. 4,546,909, Cl. 227-120.000.

Ebina, Hisashi: *See—*
Hirayama, Hiromitsu; and Ebina, Hisashi, 4,547,705, Cl. 315-219.000.

Eby, Robert S.; Stephenson, Michael J.; Andrews, Deborah H.; and Hamilton, Thomas H. UF_6-Recovery process utilizing desublimation. 4,546,611, Cl. 62-54.000.

Ecanow, Bernard: *See—*
Ecanow, Charles S.; and Ecanow, Bernard, 4,547,490, Cl. 514-21.000.

Ecanow, Charles S.; and Ecanow, Bernard, to Neomed, Inc. Synthetic whole blood and a method of making the same. 4,547,490, Cl. 514-21.000.

Eckberg, Richard P., to General Electric Company. Ultraviolet radiation-curable silicone controlled release compositions. 4,547,431, Cl. 428-413.000.

Eckert, Alton B., to Pitney Bowes Inc. Electronic postage meter reset circuit. 4,547,853, Cl. 364-464.000.

Ecoboard Limited: *See—*
Berner, Kurt, 4,547,254, Cl. 156-555.000.

Edler, Friedrich, to Chemie Und Filter GmbH, Verfahrenstechnik KG. Fluid flow machine with an electromagnetically operated diaphragm pump. 4,547,680, Cl. 307-141.000.

Edmondson, Morris S.: *See—*
Glass, Sarah M.; and Edmondson, Morris S., 4,547,475, Cl. 502-115.000.

Educational Testing Service: *See—*
Manning, Winton H., 4,547,161, Cl. 434-358.000.

EECO Incorporated: *See—*
Gabrielian, Henry, 4,547,016, Cl. 297-194.000.

Efford, Thomas W.; and Moresi, Joseph A., Jr., to Sprague Electric Company. Capacitor assembly. 4,547,829, Cl. 361-306.000.

Egawa, Hideharu, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device having contacting but electrically isolated regions of opposite conductivity types. 4,547,681, Cl. 307-279.000.

Egawa, Hideharu, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device having contacting but electrically isolated regions of opposite conductivity types. 4,547,790, Cl. 357-42.000.

Egbers, Gerhard: *See—*
Seidel, Adolf; Artzt, Peter; Egbers, Gerhard; Grimm, Helmut; Kunde, Klaus; and Schenek, Anton, 4,546,622, Cl. 66-9.00B.

Eggleton, Reginald C.; and Fry, Francis J., to Indianapolis Center for Advanced Research, Inc. (ICFAR). Acoustic microscope. 4,546,771, Cl. 128-660.000.

Eguchi, Kanemitsu, to Kitagawa Industries Co., Ltd. Room temperature shrinkable coating material. 4,547,414, Cl. 428-36.000.

Eguchi, Masuichi: *See—*
Hiramoto, Hiroo; and Eguchi, Masuichi, 4,547,455, Cl. 430-325.000.

Ehrenfried, George, to Polaroid Corporation. Method and apparatus for optimizing object distance signals. 4,547,055, Cl. 354-401.000.

Ehrman, Albert M.: *See—*
Mersfelder, Robert E.; and Ehrman, Albert M., 4,547,375, Cl. 426-52.000.

Eickmann, Karl. Arrangements to rotary valves for engines compressors, motors or pumps. 4,546,743, Cl. 123-190.00A.

Eikenberry, Jon N., to Eastman Kodak Company. Multizone analytical element and method for analyte determination. 4,547,460, Cl. 435-15.000.

Eikenberry, Jon N., to Eastman Kodak Company. Analytical element having improved spreading zone and method of use. 4,547,465, Cl. 436-170.000.

Eisinger, Frantisek L., to Foster Wheeler Energy Corporation. Roller mechanism for forming helical shapes. 4,546,631, Cl. 72-135.000.

Ejima, Tatsuhiko; Arai, Kozo; Isoyama, Eizo; and Fujihira, Tadao, to Showa Aluminum Kabushiki Kaisha. Process for treating surface of aluminum foil for use as electrode of electrolytic capacitors. 4,547,275, Cl. 204-129.750.

Ektelon: *See—*
Bosworth, Warren M., Jr.; and Martin, Fred E., 4,546,977, Cl. 273-73.00A.

Ekuan, Kenji, to C. I. Kasei Co., Ltd. Box. 4,546,898, Cl. 220-337.000.

Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Reinecke, Paul; and Scheinpflug, Hans, to Bayer Aktiengesellschaft. Azolyl-phenoxy-tetrahydrofuran-2-ylidene-methane fungicidal agents. 4,547,515, Cl. 514-383.000.

Eldec Corporation: *See—*
Little, William R.; and Daniels, Ted M., 4,547,665, Cl. 250-227.000.

Electro-Voice, Incorporated: *See—*
Bryson, Michael, 4,547,632, Cl. 179-115.5VC.

Electronic Concepts, Inc.: *See—*
Lavene, Bernard, 4,547,832, Cl. 361-307.000.

Elekes, Andras: *See—*
Martinko, Matyas; Elekes, Andras; Simon, Kalman; Bohnert, Jozef; Nemeth, Janos; Bole, Karoly; and Ilyes, Zoltan, 4,547,098, Cl. 405-291.000.

Eli Lilly and Company: *See—*
Merkel, Kurt E., 4,547,488, Cl. 514-10.000.

Elias, Anthony J., to Spurway Cooke Industries Pty., Ltd. Blind-rivet setting tool. 4,546,637, Cl. 72-391.000.

Elizondo, Roberto S. Checker or chess game board with rotatable strips. 4,546,981, Cl. 273-260.000.

Ellefson, Ronald H.: *See—*
Clark, Lonel L.; and Ellefson, Ronald H., 4,546,674, Cl. 76-107.00R.

Ellicott Machine Corporation: *See—*
Little, Charles D., 4,547,162, Cl. 440-36.000.

Elliott, James O.: *See—*
Johnson, Lynville G.; and Elliott, James O., 4,547,716, Cl. 318-443.000.

Elson, John P.: *See—*
Riffe, Delmar R.; Elson, John P.; Sathe, Dilip S.; and Grassbaugh, Walter T., 4,547,131, Cl. 417-53.000.

Emery, John H.: *See—*
Taylor, Robert R.; Bowen, Billy C.; and Emery, John H., 4,547,701, Cl. 313-500.000.

Emhart Industries, Inc.: *See—*
Nebelung, Hermann H., 4,547,212, Cl. 65-260.000.

Endo, Keiko: *See—*
Endo, Kiyomu, 4,547,129, Cl. 417-48.000.

Endo, Kiyomu, to Endo, Keiko. Air stream generating apparatus. 4,547,129, Cl. 417-48.000.

Energy Conversion Devices, Inc.: *See—*
Ayers, William, 4,547,273, Cl. 204-73.00R.
Cannella, Vincent D.; Hansell, Gregory L.; Yaniv, Zvi; and Vijan, Meera, 4,547,789, Cl. 357-23.700.

Engel, Jurgen: *See—*
Oepen, Gerhard; Engel, Jurgen; Jakovlev, Vladimir; and Thiemer, Klaus, 4,547,505, Cl. 514-255.000.

Engel, Kurt: *See—*
Scheurecker, Werner; Scheinecker, Alois; Cordella, Johannes; and Engel, Kurt, 4,546,547, Cl. 33-182.000.

Engelsberger, Herbert, to Feldmuhle Aktiengesellschaft. Multilayer, sterilizable deep-drawing film. 4,547,427, Cl. 428-349.000.

Erickson, Alan R.; and Heidt, Marvin W., to Rockwell International Corporation. VSWR Tolerant linear power amplifier. 4,547,746, Cl. 330-298.000.

Eriksoo, Edgar; Sandberg, Eva B.; and Stalhandske, Lars J. T., to Aktiebolaget Leo. Heterocyclic carboxamides, compositions containing such compounds, processes for their preparation and methods of treatment therewith. 4,547,511, Cl. 514-312.000.

Erlichman, Irving; and Hausslein, Robert W., to Polaroid Corporation. Thermal recording system and method. 4,547,784, Cl. 346-76.0PH.

Ermel, Bernard A.: *See—*
Lanigan, John J., Sr.; Glickman, Myron; George, Thazhuthekudiyil V.; and Ermel, Bernard A., 4,546,891, Cl. 212-221.000.

Ernst, Alfons, to Johannes Heidenhain GmbH. Multicoordinate sensing head. 4,547,772, Cl. 340-686.000.

Ernst Leitz Wetzlar GmbH: *See—*
Goebert, Klaus; and Buering, Ulrich, 4,547,267, Cl. 204-4.000.

Erth, Richard A.: *See—*
Kountz, Kenneth J.; and Erth, Richard A., 4,546,618, Cl. 62-201.000.

Ertle, Raymond T., to Capital City Products Company. Reticulated puffed borax having enhanced absorptive capacity. 4,547,352, Cl. 423-279.000.

Esders, Theodore W.; Lynn, Shirley Y.; Findlay, John B.; and Schubert, Richard M., to Eastman Kodak Company. Composition, analytical element and method for the quantification of creatine kinase. 4,547,461, Cl. 435-17.000.

Espiritu, Hermenegildo A., to International Telephone & Telegraph Corp. Electrical connector endbell. 4,547,035, Cl. 339-103.00M.

Estee Lauder Inc.: *See—*
Martin Saint Leon, Daniel, 4,546,529, Cl. 29-455.00R.

Eta Cerkno: *See—*
Rejc, Danilo, 4,547,760, Cl. 337-323.000.

Etablissements Mayzaud Maurice: *See—*
Barouk, Louis S.; and Mayzaud, Maurice P. (said Maurice P. Mayzaud assors. to), 4,546,557, Cl. 36-110.000.

Ethyl Corporation: *See—*
Rajan, Sundar J., 4,547,603, Cl. 585-375.000.
Ranken, Paul F., 4,547,593, Cl. 568-54.000.

Etona, Co., Ltd.: *See—*
Ebihara, Yoshiyuki, 4,546,909, Cl. 227-120.000.

Ettenberg, Michael, to RCA Corporation. Optical recording medium and information record and method of making same. 4,547,876, Cl. 369-275.000.

Euronom AB: *See—*
Cremer, Jens, 4,546,710, Cl. 110-263.000.

Evans, Jack L. Fishing rod and reel cover. 4,546,877, Cl. 206-315.110.

Everitt, Delmar: *See—*
Goldfarb, Adolph E.; and Everitt, Delmar, 4,547,166, Cl. 446-164.000.

Ex-Cell-O Corporation: *See*—
Lisiecki, Robert E., 4,546,915, Cl. 229-17.00G.

Exxon Production Research Co.: *See*—
Novak, Lucille H., 4,547,298, Cl. 252-8.50C.

Exxon Research and Engineering Co.: *See*—
Cahn, Robert P.; and Siegell, Jeffrey H., 4,546,552, Cl. 34-1.000.
Kim, Chang J., 4,547,525, Cl. 518-713.000.
Lundberg, Robert D.; and Thaler, Warren A., 4,547,542, Cl. 324-211.000.
Stiefel, Edward I.; Pan, Wie-Hin; and McKenna, Stephen, 4,547,321, Cl. 556-14.000.
Weber, P. Stan, 4,547,341, Cl. 422-147.000.

Exxon Research and Enginering Co.: *See*—
Schulz, Donald N.; Kowalik, Ralph M.; Bock, Jan; and Maurer, John J., 4,546,784, Cl. 137-13.000.

Ezaki, Atae: *See*—
Takano, Motoharu; Sugimura, Masaru; Kushima, Keiichi; and Ezaki, Atae, 4,547,343, Cl. 422-304.000.

F.I.N.D. Research Corporation: *See*—
Gannon, James J., 4,547,382, Cl. 426-482.000.

Fabre, Jean-Louis; Farge, Daniel; James, Claude; and Lave, Daniel, to Rhone-Poulenc Sante. Substituted phenyl piperazinyl pyrrolidin-2-ones and related compounds useful as anti-depressants and their use. 4,547,504, Cl. 514-255.000.

Fabrique Nationale Hersta' *See*—
Dumortier, Thierry M., 4,546,730, Cl. 114-98.000.

Fabris, Hubert J.: *See*—
Melby, Earl G.; Fabris, Hubert J.; Livigni, Russell A.; and Cocain, Harry W., 4,547,550, Cl. 525-205.000.

Fan, John C. C.; and Gale, Ronald P., to Massachusetts Institute of Technology. Solar cells and photodetectors. 4,547,622, Cl. 136-249.000.

Fantin, Lino. Electrically powered device for opening and closing the visor of a crash helmet. 4,546,498, Cl. 2-424.000.

Fantuzzo, Joseph: *See*—
Ammenheuser, Herbert H.; and Fantuzzo, Joseph, 4,547,064, Cl. 355-15.000.

Fanuc Ltd: *See*—
Sakamoto, Keiji; and Seki, Shinji, 4,547,719, Cl. 318-723.000.

Farge, Daniel: *See*—
Fabre, Jean-Louis; Farge, Daniel; James, Claude; and Lave, Daniel, 4,547,504, Cl. 514-255.000.

Fargo Electronic Services Inc.: *See*—
Cummins, Robert P., 4,547,780, Cl. 346-9.000.

Farr, Glyn P. R.: *See*—
Brearley, Malcolm; and Farr, Glyn P. R., 4,547,022, Cl. 303-6.00C.

Fast, Jacob. Strip merchandiser. 4,546,943, Cl. 248-205.300.

Feeny, Richard J.: *See*—
Zilligen, James A.; and Feeny, Richard J., 4,547,240, Cl. 156-85.000.

Fehr, Ivor J. M.: *See*—
Baker, Hugh W. B.; Buckle, Valerie A.; and Fehr, Ivor J. M., 4,547,090, Cl. 401-235.000.

Fei, Alberto, to Dr. Alberto Ciampolini Strumenti Scientifici. Device for the detection and calculation of particles present in a moving suspension for hematological analyses and the like. 4,547,075, Cl. 356-440.000.

Feldman, Joachim; and Oberlander, Andreas, to Wabco Fahrzeugbremsen GmbH. Brake actuator device with automatic slack adjuster. 4,546,860, Cl. 188-71.400.

Feldmuhle Aktiengesellschaft: *See*—
Engelsberger, Herbert, 4,547,427, Cl. 428-349.000.

Fellner, Donald: *See*—
Bellin, Howard T.; Fellner, Donald; and Tchorbajian, Nichan, 4,546,776, Cl. 128-704.000.

Fenyvesi, Eva; Szejtli, Jozsef; Zsadon, Bela; Antal, Balazs; and Wagner nee Kohary, Ildiko , to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. Cyclodextrin polymers swelling quickly and to a great extent in water and process for the preparation thereof. 4,547,572, Cl. 536-103.000.

Ferguson, Ian J.: *See*—
Bell, Vivien L.; Ferguson, Ian J.; and Weatherley, Mark J., 4,547,444, Cl. 430-11.000.

Ferguson, James H.: *See*—
Bath, Duncan T.; and Ferguson, James H., 4,547,690, Cl. 310-214.000.

Ferierabend, Georg. Inhalation apparatus for animals. 4,546,768, Cl. 128-200.160.

Ferranti, plc: *See*—
Parker, John C., 4,547,677, Cl. 250-578.000.

Ferrara, Daniel A., to Summagraphics Corporation. Easel. 4,546,948, Cl. 248-454.000.

Ferraro, Frank A.: *See*—
Kiraly, Ernest F.; and Ferraro, Frank A., 4,546,544, Cl. 30-90.000.

Fiat Auto S.p.A.: *See*—
Abbate Daga, Silvano, 4,547,021, Cl. 301-37.00P.
Parisi, Ettore, 4,547,007, Cl. 292-84.000.

Field, Carl R., to Duz-Mor, Inc. Apparatus for repairing and straightening vehicles. 4,546,638, Cl. 72-455.000.

Filtertek, Inc.: *See*—
Leason, Hayden L., 4,547,190, Cl. 604-185.000.

Finch, Harry E.; and Szayer, Geza J. Partition wall system and components therefor. 4,546,590, Cl. 52-520.000.

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Eaders, Theodore W.; Lynn, Shirley Y.; Findlay, John B.; and Schubert, Richard M., 4,547,461, Cl. 435-17.000.

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Doherty, James B.; Ashe, Bonnie M.; Finke, Paul E.; Shah, Shrenik K.; Thompson, Kevan R.; and Zimmerman, Morris, 4,547,371, Cl. 514-200.000.

Fischer, Kurt, to Bison-Werke Bahre & Greten GmbH & Co. KG. Belt grinding machine. 4,546,572, Cl. 51-140.000.

Fischer, Thomas; and Bongers, Bernd, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Connecting rod made of fiber reinforced synthetic material. 4,546,669, Cl. 74-579.00E.

Fisher, Robert L.: *See*—
Langley, Lawrence W.; and Fisher, Robert L., 4,547,713, Cl. 318-254.000.

Fitzpatrick, Brian J., to North American Philips Corporation. Green luminescing cathode-ray tube device. 4,547,699, Cl. 313-478.000.

Flamm, Peter M., to ITT Industries, Inc. MOS Parallel A/D converter. 4,547,763, Cl. 340-347.0CC.

Flannagan, Stephen T.: *See*—
Reese, Edmund A.; Spaderna, Dieter W.; and Flannagan, Stephen T., 4,547,867, Cl. 365-189.000.

Flax, Stephen W., to General Electric Company. Method and means for determining ultrasonic wave attenuation in tissue using phase locked loop. 4,546,772, Cl. 128-660.000.

Flo Trend Shares, Inc.: *See*—
Lott, W. Gerald, 4,546,783, Cl. 134-109.000.

Floyd, William C., to Sun Chemical Corporation. Dioxane compounds and their use as insolubilizers for binders for paper coating compositions. 4,547,580, Cl. 549-379.000.

Flynn, Cormack: *See*—
Rohr, Martin; and Flynn, Cormack, 4,547,315, Cl. 252-522.00R.

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Gotal, John D.; and Scott, Junius D., 4,547,712, Cl. 318-128.000.

Fogarty, John D.; and Borsuk, Gerald M., to Westinghouse Electric Corp. TV Scrambler/descrambler using serial memories. 4,547,802, Cl. 358-119.000.

Fogg, Jeffrey R., to Caterpillar Tractor Co. Wall construction for a vehicle cab. 4,546,696, Cl. 98-2.180.

Fontaine, Jean F. L.; and Graas, Maurice, to Goodyear Tire & Rubber Company, The. Pneumatic tire. 4,546,808, Cl. 152-209.00R.

Forberg, Horst; and Delakowitz, Bernd, to Krone GmbH. Device for connecting insulated wires to twin-terminal contact elements. 4,547,034, Cl. 339-97.00P.

Forbus, Nancy P., to Mobil Oil Corporation. Modified ZSM-12 catalysts and processes for conversion of propane to propylene. 4,547,618, Cl. 585-660.000.

Forch, Hans, to Carl Freudenberg, Firma. Lip seal with channeled and non-channeled portions. 4,546,985, Cl. 277-134.000.

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Grider, Duane M.; and Daykin, Theodore W., 4,546,741, Cl. 123-337.000.
Middleton, Daryl J.; and Grenier, Jodyne L., 4,547,400, Cl. 427-160.000.

Forgione, Peter S.; Singh, Balwant; and Sedlak, John A., to American Cyanamid Company. Method for sizing paper using hydrolyzed homopolymers or copolymers of meta- or para- isopropenyl-α,α-dimethylbenzylisocyanate. 4,547,265, Cl. 162-164.600.

Foster, Edward P.: *See*—
Tewari, Krishna C.; and Foster, Edward P., 4,547,201, Cl. 44-51.000.

Foster, Michael R.: *See*—
Marchent, Brian G.; and Foster, Michael R., 4,546,550, Cl. 33-356.000.

Foster Wheeler Energy Corporation: *See*—
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McLaughlin, Wayne C.; Recker, William J.; Modesitt, Phillip C.; and Francescon, Paul K., 4,546,830, Cl. 166-370.000.

Franco-Ferreira, Edgard A.; and Toohey, William J., to Russell, Larry. Seam tracker. 4,547,653, Cl. 219-124.340.

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Braić, Milton, deceased, 4,547,302, Cl. 252-48.400.

Franks, Jeffrey L., to Prince Corporation. Electrical control system. 4,546,551, Cl. 33-356.000.

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Harbison, William H.; and Frankus, Andrew, 4,546,518, Cl. 15-250.230.

Frassanito, John R., to Sani-Fresh International, Inc. Dispenser and package for liquid or granular materials. 4,546,904, Cl. 222-185.000.

Freitag, Ronald G.; Degenford, James E.; and Boire, Daniel C., to Westinghouse Electric Corp. Composite amplifier with divider/combiner. 4,547,745, Cl. 330-286.000.

French, Jack G., to Mars, Incorporated. Cathode ray tube display device. 4,547,709, Cl. 315-378.000.

French, Robert C.: *See*—
Nebergall, Perry A.; and French, Robert C., 4,547,641, Cl. 219-10.410.

French, Robert J.; and Dorony, Elmer F., to Interior Steel Equipment Co. Seal arrangement for compact storage systems. 4,547,026, Cl. 312-201.000.

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di Ricco, Leo; Schnee, Edward; Stefanini, Zorro; and Frew, Duncan W., 4,547.534, Cl. 523-324.000.

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Krebs, Gerd, 4,547,012, Cl. 294-93.000.

Frier, Richard A.: *See*—
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Frito-Lay, Inc.: *See*—
Silver, Myron E.; and Wisdom, Lawrence W., 4,547,376, Cl. 426-102.000.
Fritsch, Rudolf P.; and Hench, Hans. Rotary cutting tool, particularly for comminuting plastic material. 4,546,929, Cl. 241-294.000.
Fritts, David H.: *See*—
Maloy, Joseph T.; Leonard, John F.; and Fritts, David H., 4,546,897, Cl. 220-277.000.
Fritz, Heinz P.: *See*—
Besenhard, Jurgen O.; Wudy, Erich; and Fritz, Heinz P., 4,547,442, Cl. 429-209.000.
Froment, Jean P., to S. A. des Etablissements STAUBLI (France). Draw lever assemblies mounted on the dobbies and other mechanism for forming the shed on weaving machines. 4,546,800, Cl. 139-66.00A.
Frommlet, Hubert; and Hahn, Michael, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Wing mounting for a rotary wing aircraft. 4,547,127, Cl. 416-134.00A.
Fruehauf Corporation: *See*—
Martin, John F.; and Zweifel, Charles H., 4,546,852, Cl. 182-12.000.
Fry, Francis J.: *See*—
Eggleton, Reginald C.; and Fry, Francis J., 4,546,771, Cl. 128-660.000.
Fry, Jeremy J., to Rotork Controls Limited. Valve actuators. 4,546,671, Cl. 74-625.000.
Fryer, Rodney I.; Gilman, Norman W.; Trybulski, Eugene J.; and Walser, Armin, to Hoffmann-La Roche Inc. Pyrimido-2-benzazepines and intermediates in their preparation. 4,547,581, Cl. 549-451.000.
Fuchizawa, Testuro: *See*—
Asahina, Miyoshi; Kitagawa, Keishi; and Fuchizawa, Testuro, 4,547,445, Cl. 430-22.000.
Fuchs, Francis J., Jr. Methods and apparatus for initiating tubular extrusion. 4,546,634, Cl. 72-264.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Takahashi, Toshio, 4,546,646, Cl. 73-117.300.
Takahashi, Toshio, 4,546,647, Cl. 73-118.000.
Fuji Medical Instruments Mfg. Co., Ltd.: *See*—
Hayakawa, Yoichi; Yokoyama, Shoji; and Ito, Yasunobu, 4,547,178, Cl. 474-11.000.
Fuji Photo Film Company: *See*—
Maeda, Minoru; Iwasaki, Masayuki; Inoue, Noriyuki; and Totsuka, Mikio, 4,547,450, Cl. 430-202.000.
Fuji Photo Film Co. Ltd.: *See*—
Arakawa, Satoshi; and Takahashi, Kenji, 4,547,672, Cl. 250-483.100.
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Asai, Takamitsu; Kitamoto, Tatsuji; and Akashi, Goro, 4,547,393, Cl. 427-48.000.
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Ohashi, Azusa; Sakaki, Hirokazu; Nakanishi, Haruo; Tanabe, Zenichi; Tsuchida, Shin; and Hayashi, Yoshikatsu, 4,547,274, Cl. 204-129.400.
Shirahata, Ryuji; Sekine, Masaru; and Akashi, Goro, 4,546,725, Cl. 118-718.000.
Toya, Ichizo, 4,547,452, Cl. 430-216.000.
Fuji Xerox Co., Ltd.: *See*—
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Fujihara, Hiroko, heiress: *See*—
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Fujihira, Tadao: *See*—
Ejima, Tatsuhiko; Arai, Kozo; Isoyama, Eizo; and Fujihira, Tadao, 4,547,275, Cl. 204-129.750.
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Fujita, Yosuke; Tohda, Takao; Matsuoka, Tomizo; Abe, Atsushi; and Nitta, Tsuneharu, to Matsushita Electric Industrial Co., Ltd. Thin film electroluminescent element. 4,547,703, Cl. 313-509.000.
Fujitsu Limited: *See*—
Kawabe, Yunosuke; and Momma, Yoshinobu, 4,546,537, Cl. 29-576.00W.
Mita, Kikuo; Oyama, Masayuki; Yoshida, Takashi; Nakashima, Masato; Fujihara, Katsumi; and Nakakuki, Tadao, 4,547,895, Cl. 382-8.000.
Mochizuki, Akihiro; Ikegami, Kasumi; Narusawa, Toshiaki; and Okuyama, Hirofumi, 4,547,309, Cl. 252-299.630.
Nishida, Hidehiko; Koshino, Minoru; Tateishi, Terutaka; and Hattori, Akira, 4,547,848, Cl. 364-200.000.
Takada, Tadakazu; and Shimizu, Katsunori, 4,547,260, Cl. 156-643.000.
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Fujiwara, Katsuyoshi, to Sharp Kabushiki Kaisha. Copy paper supply timing control in a copying machine. 4,547,062, Cl. 355-14.00R.
Fukai, Toshimasa: *See*—
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Fukami, Yasuhiko; Sawada, Toshiichi; and Kinkori, Shuzo, to Nippondenso Co., Ltd. Resonator for internal combustion engines. 4,546,733, Cl. 123-52.0MB.
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Fukuoka, Shinsuke; Chono, Masazumi; Watanabe, Tomonari; and Kohno, Masashi, to Asahi Kasei Kogyo Kabushiki Kaisha. Method for manufacture of diphenylmethane diisocyanates. 4,547,322, Cl. 260-453.00P.
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Leroy, Vernon A.; Gaedtke, Harold D.; and Gaedtke, Harold D., 4,546,756, Cl. 126-424.000.
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Gailey, Edward D., to S-P Manufacturing Corporation, The. Chuck top jaw with removable insert. 4,546,988, Cl. 279-123.000.
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Gaines, Mary L.; and Gaines, Charles J., to Mary L. Gaines, Corp. Golf card game. 4,546,982, Cl. 273-298.000.
Gaither, John D., to Champion Laboratories, Inc. Thermostatically controlled pack hold-down assembly. 4,547,287, Cl. 210-149.000.
Gale, Ronald P.: *See*—
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Rionda, Carlos S.; and Palacio, Joaquin J., 4,546,579, Cl. 52-92.000.
Gannon, James J., to F.I.N.D. Research Corporation. Process of separating husks from dried spent grains. 4,547,382, Cl. 426-482.000.
Garber, Michael I. Necktie construction. 4,546,494, Cl. 2-144.000.
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Gartner, Karl, to Yoshida Kogyo K. K. Unit curtain wall. 4,546,582, Cl. 52-235.000.
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Gaspardo, Luigi. Connecting-rod system particularly for mowers. 4,546,670, Cl. 74-595.000.

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Gazzero, Robert: *See—*
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Geist, Michael; and Diefenbach, Horst, to BASF Farben & Fasenn A.G. Self-crosslinking heat-curable binder. 4,547,409, Cl. 427-386.000.
Gelhorn, Carolyn; and Gulas, Michael P., to Gelhorn, Carolyn. Device for recording distances traveled on personal and business use. 4,547,781, Cl. 346-33.00R.
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General Dynamics Pomona Division: *See—*
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Rocha, Henry A. F.; and Harnden, John D., Jr., 4,546,658, Cl. 73-862.590.
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Spiro, Clifford L., 4,546,925, Cl. 241-1.000.
Zarchy, Andrew S., 4,547,292, Cl. 210-634.000.
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Saleeb, Fouad Z.; and Zeller, Bary L., 4,547,378, Cl. 426-271.000.
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Johnson, Lynville G.; and Elliott, James O., 4,547,716, Cl. 318-443.000.
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Shellhause, Ronald L., 4,546,862, Cl. 188-331.000.
General Signal Corporation: *See—*
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Genies, Eugene, to Commissariat a l'Energie Atomique. Electrochemical generator. 4,547,439, Cl. 429-105.000.
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Gerhaher, Max; and Gerhaher, Franz. Ridge tile. 4,546,577, Cl. 52-57.000.
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Rohr, Martin; and Flynn, Cormack, 4,547,315, Cl. 252-522.00R.
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Leopold, Edmund A.; and McKeown, Glen D., 4,546,723, Cl. 118-669.000.
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Abrams, Bernard W.; and Karbo, Donald J., 4,546,960, Cl. 267-136.000.

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Avidan, Amos A.; Gould, Ronald M.; and Kane, Steven E., 4,547,616, Cl. 585-640.000.

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Maerfeld, Charles; Josserand, Michel; and Gragnolati, Claude, 4,547,870, Cl. 367-155.000.

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Arditty, Herve ; and Graindorge, Philippe, 4,547,650, Cl. 219-121.0LE.

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Granata, Helen E. Seam presser. 4,546,560, Cl. 38-1.00B.

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Middleton, Daryl J.; and Grenier, Jodyne I., 4,547,400, Cl. 427-160.000.

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Tusinski, Joseph; Hill, Phillip D.; and Griffith, John M., 4,547,242, Cl. 156-105.000.

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Swiatosz, Edmund; and Grimmer, Paul D., 4,547,656, Cl. 219-300.000.

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Petersen, Uwe; Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,547,503, Cl. 514-254.000.

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Grosser, Johannes. Arrangement for optical path length variation. 4,547,041, Cl. 350-622.000.

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Rohde, Gunter; Holzinger, Dieter; and Grossmann, Udo, 4,546,930, Cl. 242-56.00R.

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Guzzi, Umberto; and Ciabatti, Romeo, 4,547,521, Cl. 514-530.000.

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Giammarrusco, David P., 4,547,630, Cl. 179-89.000.

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Wang, Da Y.; and Kennedy, Daniel T., 4,547,281, Cl. 204-424.000.

GTE Products Corporation: *See—*
Avellino, Frank J.; and Johnson, Robert R., 4,547,891, Cl. 377-16.000.
Landry, Geraldine A., 4,547,700, Cl. 313-487.000.
Ojanen, Randall W., 4,547,020, Cl. 799-86.000.
Schrank, Martin P., 4,547,702, Cl. 313-509.000.

Gude, Fritz; and Haferkorn, Herbert, to Chemische Werke Huls Aktiengesellschaft. Process for removing naphthoquinone from phthalic anhydride produced through air oxidation of naphthalene. 4,547,578, Cl. 549-250.000.

Guerriero, Renato; Veronese, Giuseppe; Baradel, Agostino; and Rivola, Luigi, to SAMIM Societa Azionaria Minero-Metallurgica S.p.A. Process for the separation of arsenic from acid solutions containing it. 4,547,346, Cl. 423-87.000.

Guerry-Kopecko, Patricia: *See—*
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Gulas, Michael P.: *See—*
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Cicci, George B.; and Guldberg, Erik J., 4,546,599, Cl. 56-16.400.

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Vogel, Roger F.; Rennard, Raymond J.; and Tabacek, Joseph A., 4,547,487, Cl. 502-351.000.

Gupte, Arun R.: *See—*
Zierenberg, Bernd; and Gupte, Arun R., 4,547,359, Cl. 424-22.000.

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Gustafson, Harold L. Building structure support system. 4,546,581, Cl. 52-169.900.

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Guy E. Lane: *See—*
Davidson, Alvin L., 4,547,110, Cl. 414-22.000.

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Gygax, Claude-Andre , to Omega SA. Releasable hinge for a bracelet. 4,546,522, Cl. 24-71.00J.

Haberl, Josef: *See—*
Radermacher, Karl-Heinz; and Haberl, Josef, 4,547,717, Cl. 318-484.000.

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Hader, Helmut. Coupling for releasably fixing a dental prothesis in the mouth. 4,547,156, Cl. 433-172.000.

Hadfield, Elden E. Dual track drapery support device. 4,546,809, Cl. 160-126.000.

Haeger, Oyvind. Woodworking machine. 4,546,804, Cl. 144-1.00G.

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Haferl, Peter E., to RCA Corporation. Variable picture size circuit for a television receiver. 4,547,708, Cl. 315-371.000.

Hagen, Max; and Sebulke, Johannes, to Ringspann Albrecht Maurer K.G. One-way clutch. 4,546,864, Cl. 192-41.00A.

Hageniers, Omer L.: *See—*
Pryor, Timothy R.; Hageniers, Omer L.; and North, Walter P. T., 4,547,674, Cl. 250-560.000.

Hagerty, Robert O.: *See*—
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Hoffmann, Gerhard; Bronwert, Bernd; Hahn, Herbert; and Jun, Mong-Jon, 4,547,454, Cl. 430-271.000.

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Hansen, Diethard; and Wilhelm, Martin, 4,547,679, Cl. 307-108.000.

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Frommlet, Hubert; and Hahn, Michael, 4,547,127, Cl. 416-134.00A.

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Khoobiar, Sargis, 4,547,588, Cl. 562-535.000.

Hall, Dale E.; and Brown, Douglas S., to Inco Alloys International, Inc. Cathode for hydrogen evolution. 4,547,278, Cl. 204-290.00R.

Hall, James T.; and Leyden, Richard N., to Hughes Aircraft Company. Process for the photochemical vapor deposition of hetero-linked polymers. 4,547,395, Cl. 427-54.100.

Hallbach, Raymond L.; and Reynolds, John S., to Cincinnati Milacron Inc. Automatic toolchanger system for turning machine. 4,546,533, Cl. 29-568.000.

Halon, Bernard: *See*—
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Halstead Industries, Inc.: *See*—
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Hamada, Takaaki; Kobayakawa, Yohji; Nishikawa, Akira; and Kawahara, Manabu, to Kumahira Safe Co., Inc. Conveyor system for a drive-in bank. 4,546,857, Cl. 186-37.000.

Hamaguchi, Toshiaki; Namikawa, Kazuhira; Goshima, Toshikazu; Nakamura, Mutsuaki; Kuroda, Akio; and Kudo, Yoshiaki, to Victor Company of Japan, Ltd.; and Shin-Etsu Chemical Co., Ltd. High density information record made of a conductive resin composition comprising a specific type of dimethylpolysiloxane. 4,547,545, Cl. 524-269.000.

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Ryan, Carl R.; and Hambley, Allan R., 4,547,888, Cl. 375-14.000.

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Hammer, Joel B.; and Gronholm, Richard A., to Westinghouse Electric Corp. Dynamoelectric machine with rotor ventilation system including prewhirl inlet guide vanes. 4,547,688, Cl. 310-59.000.

Hammond, Michael D. Ice breaker and scraper. 4,546,513, Cl. 15-105.000.

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Abt, Jurgen; Handtmann, Dieter; Schwartz, Reinhard; and Wocher, Bertold, 4,546,648, Cl. 73-119.00A.

Hanley, Michael J., to Rockwell International Corporation. Non-linear adder. 4,547,878, Cl. 370-62.000.

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Bergmann, Udo; Hansen, Guenter; and Zeidler, Georg, 4,547,566, Cl. 534-684.000.

Hanson, Charles B., to J. I. Case Company. Multi-surface stabilizer pad assembly. 4,546,996, Cl. 280-764.100.

Hanson, Theodore F. Portable folding platform apparatus used with a ladder and winch. 4,546,853, Cl. 182-103.000.

Hara, Kunihiko: *See*—
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Kobayashi, Akio; Harada, Susumu; Harada, Takashi; Kikuchi, Takehiro; and Honda, Masakazu, 4,546,747, Cl. 123-489.000.

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Dunn, James C.; Hardee, Harry C.; and Striker, Richard P., 4,547,080, Cl. 374-135.000.

Harman, Geoffrey E.: *See*—
Moore, Alan; Harman, Geoffrey E.; Rosser, David G.; and Clapham, Edward F., 4,546,604, Cl. 60-39.093.

Harnden, John D., Jr.: *See*—
Rocha, Henry A. F.; and Harnden, John D., Jr., 4,546,658, Cl. 73-862.590.

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Harris Corporation: *See*—
Beasom, James D., 4,546,539, Cl. 29-577.00C.
Duke, Billy M., 4,546,871, Cl. 198-425.000.

Harrison, Dan W. Handtool. 4,546,510, Cl. 7-145.000.

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Harter, Mark A.: *See*—
Schoumaker, Raoul J. P.; and Harter, Mark A., 4,546,889, Cl. 211-105.300.

Hartley, Michael D.: *See*—
Sticher, Charles K., Jr.; and Hartley, Michael D., 4,547,657, Cl. 219-492.000.

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Perlberg, William, 4,547,360, Cl. 424-45.000.

Harvey Hubbell Incorporated: *See*—
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Hase, Christian; Bischoff, Martin; Schmadel, Edmund; and Vogt, Gunther, to Henkel KGaA. Fabric detergent compositions containing acylcyanamides. 4,547,306, Cl. 252-99.000.

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Hashimoto, Isamu: *See*—
Suzuki, Takeomi; Ishibashi, Kenzo; and Hashimoto, Isamu, 4,547,676, Cl. 250-578.000.

Hattori, Akira: *See*—
Nishida, Hidehiko; Koshino, Minoru; Tateishi, Terutaka; and Hattori, Akira, 4,547,848, Cl. 364-200.000.

Hattori, Torao, to Honda Giken Kogyo Kabushiki Kaisha. Interlocking driving belt. 4,547,181, Cl. 474-204.000.

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Haught, Robert M. Leveling device for hemodynamic monitoring transducer assembly. 4,546,774, Cl. 128-673.000.

Hausberg, Hans-Heinrich; Bottcher, Henning; Gottschlich, Rudolf; Seyfried, Christoph; and Minck, Klaus-Otto, to Merck Patent Gesellschaft mit beschrankter Haftung. Tetrahydrocarbazole derivatives. 4,547,576, Cl. 546-197.000.

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Erlichman, Irving; and Hausslein, Robert W., 4,547,784, Cl. 346-76.0PH.

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Dombroski, John R.; Hawkins, J. Maynard; Pollock, Mark A.; Leonard, Alan P.; and Mitchell, Thomas A., 4,547,329, Cl. 264-118.000.

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Hayakawa, Yoichi; Yokoyama, Shoji; and Ito, Yasunobu, to Fuji Medical Instruments Mfg. Co., Ltd. Control system for an automatic transmission for a vehicle. 4,547,178, Cl. 474-11.000.

Hayashi, Akira: *See*—
Koinuma, Yutaka; Ikenoya, Yasuo; and Hayashi, Akira, 4,546,843, Cl. 180-229.000.

Hayashi, Jun: *See*—
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Hayes, John W. Proportional mixing means. 4,547,128, Cl. 417-2.000.

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Dean, Robert; Reyner, Peter J.; and Heiman, Frederic P., 4,546,869, Cl. 194-99.000.

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Pape, Dieter; and Woerz, Hans, 4,547,103, Cl. 408-197.000.

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Fritsch, Rudolf P.; and Hench, Hans, 4,546,929, Cl. 241-294.000.

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Hase, Christian; Bischoff, Martin; Schmadel, Edmund; and Vogt, Gunther, 4,547,306, Cl. 252-99.000.
Kloetzer, Dietrich; Linde, Karl-Heinz; and Ojust, Klaus, 4,547,318, Cl. 260-400.000.

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Merrick, Edwin B., 4,546,651, Cl. 73-701.000.

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Dreiling, Peter M., 4,546,576, Cl. 51-372.000.

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Mason, John Y.; and Hicks, Bruce W., 4,547,381, Cl. 426-316.000.

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Hill, Phillip D.: *See—*
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Berecz, Imre; and Hinton, Dennis L., 4,546,833, Cl. 173-12.000.

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Terauchi, Kiyoshi; and Hiraga, Masaharu, 4,547,137, Cl. 418-55.000.

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Masuyama, Masaru; Hirooka, Susumu; and Yamaoka, Nobutatsu, 4,547,314, Cl. 252-520.000.

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Kamifuji, Hiroshi; Ito, Tomoo; Kobayashi, Haruhiko; and Itakura, Tomiya, 4,547,852, Cl. 364-431.040.

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Genma, Hideaki, 4,547,850, Cl. 364-200.000.
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Karasawa, Yoshiharu; and Takata, Yoshinori, 4,547,280, Cl. 204-403.000.
Karino, Kimiji; and Kosuge, Tokuo, 4,546,748, Cl. 123-494.000.
Kiyota, Hideharu; and Horiuchi, Mitsuaki, 4,547,279, Cl. 204-298.000.
Kodama, Naoki; Takeshita, Masatoshi; Suzuki, Ryo; Takeuchi, Teruaki; and Sugita, Yutaka, 4,547,865, Cl. 365-12.000.
Nakata, Yukio; and Shiotsu, Osamu, 4,547,751, Cl. 332-16.00R.
Okamoto, Yoshio; Iwai, Kazumi; Inoue, Hiroshi; Kunugi, Yoshifumi; and Shinozaki, Tadashi, 4,546,795, Cl. 137-624.150.
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Sugiyama, Toshio; and Yamane, Yoshio, 4,547,871, Cl. 369-44.000.
Tobita, Tomoyuki; Yamamoto, Yoshimi; Nagasu, Akira; and Takahashi, Yukio, 4,546,653, Cl. 73-720.000.
Tosaki, Hiromi; Tanei, Hirayoshi; Ikegami, Akira; and Sugishita, Nobuyuki, 4,547,625, Cl. 174-68.500.
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Uchida, Kenji; Sakamoto, Masakatsu; Saito, Makoto; Kamino, Yukishige; and Miyadera, Hiroshi, 4,547,132, Cl. 417-63.000.
Ueyanagi, Kiichi; Umemoto, Yasunari; Takahashi, Susumu; and Nakamura, Michiharu, 4,546,540, Cl. 29-579.000.
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Ho, Chih Y., to McNeilab, Inc. Amidine benzodiazepines, methods for their use and intermediates. 4,547,497, Cl. 514-219.000.

Hodgman, John R.; and Weil, Jack M. Aircraft engine accessory unit drive. 4,546,865, Cl. 192-84.00C.

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Konz, Elmar; and Kruse, Hansjorg, 4,547,508, Cl. 514-307.000.
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Nestler, Hans J., 4,547,583, Cl. 560-061.000.
von der Eltz, Hans-Ulrich; and Oppitz, Peter, 4,546,624, Cl. 68-13.00R.

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Hoffmann-La Roche Inc.: *See—*
Fryer, Rodney I.; Gilman, Norman W.; Trybulski, Eugene J.; and Walser, Armin, 4,547,581, Cl. 549-451.000.

Hofle, Lothar; and Autenrieth, Veit, to Bilz, Reiner; and Bilz, Axel. Quick-change chuck. 4,547,105, Cl. 408-141.000.

Hokko Chemical Industry Co., Ltd.: *See—*
Kaneko, Kimiyoshi; Ishikawa, Hiromichi; Moriyama, Satoru; and Uchiyama, Tsugio, 4,547,524, Cl. 514-594.000.

Holland, John D. Tangle-free pet hitch and feeding station. 4,546,730, Cl. 119-117.000.

Holland, Robert E.; and Tabak, Samuel A., to Mobil Oil Corporation. Conversion of Fischer-Tropsch oxygenates to middle distillate. 4,547,601, Cl. 585-310.000.
Holmer, Larry G., to Refractory Products Co. Gas-fired radiant burner. 4,547,148, Cl. 431-328.000.
Holmes, Horace D. Tap. 4,547,104, Cl. 408-220.000.
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Homac Mfg. Company: *See*—
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Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hattori, Torao, 4,547,181, Cl. 474-204.000.
Koinuma, Yutaka; Ikenoya, Yasuo; and Hayashi, Akira, 4,546,843, Cl. 180-229.000.
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Honeywell Inc.: *See*—
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Beyer, Kenneth E.; and Horlacher, Wilhelm H., 4,546,955, Cl. 251-129.150.
Bohan, John E., Jr., 4,546,918, Cl. 236-46.00R.
Dietiker, Paul; Olson, Elwyn H.; and Torborg, Ralph H., 4,547,144, Cl. 431-20.000.
Lutes, Olin S.; and Walters, Wayne L., 4,547,866, Cl. 365-173.000.
Peterson, Russell H., 4,547,897, Cl. 382-8.000.
Hooper, Alan; and North, John M., to United Kingdom Atomic Energy Authority. Electrochemical cell. 4,547,440, Cl. 429-112.000.
Hooper, Francis H. A.: *See*—
Martin, Timothy J.; Page, Bernard T.; and Hooper, Francis H. A., 4,546,861, Cl. 188-79.5GE.
Hoover, John W.: *See*—
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Hopkins, David: *See*—
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Hoppe, Udo; Wittern, Klaus-Peter; Sauermann, Gerhard; Stelling, Otto; and Rockl, Manfred. Cake of soap with deodorizing action. 4,547,307, Cl. 252-107.000.
Horak, Dan, to Allied Corporation. Dynamic control for manipulator. 4,547,858, Cl. 364-513.000.
Hori, Shigekazu: *See*—
Torizuka, Hideki; Soejima, Tomohide; and Hori, Shigekazu, 4,547,750, Cl. 331-99.000.
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Tamai, Kenzo; Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Tsuda, Hisatsugu; Sakai, Hiroshi; Sugita, Masatoshi; Yamamoto, Yoshiko; Minami, Hisashi; and Hori, Takako, 4,547,462, Cl. 435-72.000.
Horimoto, Yukihiro, to Young Sangyo Co., Ltd. Stuffed toy. 4,547,171, Cl. 446-370.000.
Horiuchi, Mitsuaki: *See*—
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Mouser, Donald D., 4,546,973, Cl. 273-1.50R.
Horlacher, Wilhelm H.: *See*—
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Hosoe, Kazuya: *See*—
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Houle, Raymond T.; Kilbourn, Frederick A.; De Kraker, James E.; and Nilsson, Robert T., to Silchor. Home bathing unit. 4,546,506, Cl. 4-555.000.
Howard, L. Brewster, to American Saw & Mfg. Company. Method and apparatus for operating a band saw. 4,546,682, Cl. 83-13.000.
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Nakajima, Sadahiro; Kanamori, Chiemi; and Toratani, Hisayoshi, 4,547,402, Cl. 427-169.000.
Hoyne, Donald B.: *See*—
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Hsiung, Andrew K., to Neptune Microfloc, Inc. Water filtration process and apparatus having upflow filter with buoyant filter media and downflow filter with nonbuoyant filter media. 4,547,286, Cl. 210-738.000.
Hsu, Joseph C.; Schroeder, George O.; and Steen, Robert A., to American Can Company. Package having oil-containing product. 4,546,882, Cl. 206-484.000.
Huang, E-Jen. Safety valve. 4,546,791, Cl. 137-512.000.
Huber, Richard; and Wirz, Peter, to Klinger AG. Fluid valve. 4,546,790, Cl. 137-315.000.
Hucker, David J., to Sundstrand Corporation. Multiple output DC power supply. 4,547,843, Cl. 363-67.000.
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Huetter, Peter. Multiple queen beehive. 4,546,509, Cl. 6-1.000.
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Hughes Aircraft Company: *See*—
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Hunting Oilfield Services (U.K.) Limited: *See*—
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Huseby, Irvin C.; and Bobik, Carl F., to General Electric Company. High thermal conductivity aluminum nitride ceramic body. 4,547,471, Cl. 501-98.000.
Hussar, Gary. Modular building construction system. 4,546,583, Cl. 52-236.100.
Husson, Alan L.; and Tinios, Pantelis G., to Westinghouse Electric Corp. Digital tachometer. 4,547,732, Cl. 324-166.000.
Hwang, Shih M. Safety groove of tubular locks. 4,546,629, Cl. 70-363.000.
Hydril Company: *See*—
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Hydro-Horse, Inc.: *See*—
Kime, James A., 4,546,607, Cl. 60-372.000.
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Lotter, Manfred; and Stolzer, Rainer, 4,546,692, Cl. 92-12.200.
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Ichimura, Koichi: *See*—
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Ife, Robert J., to Smith Kline & French Laboratories Limited. 2-Pyridylaminoakylamino-4-pyrimidones useful as histamine H_1-antagonists. 4,547,506, Cl. 514-272.000.
Igashira, Toshihiko; Sakakibara, Yasuyuki; Abe, Seiko; Koide, Hiroshi; and Shinoda, Kazuo, to Nippon Soken, Inc.; and Toyota Jidosha Kabushiki Kaisha. Fuel injection apparatus. 4,546,749, Cl. 123-506.000.
IGI Biotechnology, Inc.: *See*—
Milch, Robert A.; Guerry-Kopecko, Patricia; Koeble-Smith, Carol; and Sybert, Edward M., 4,547,226, Cl. 127-41.000.
Ii, Motohiko: *See*—
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Ii, Tadashi. Nozzle for atomizing fluids. 4,546,923, Cl. 239-406.000.
Iijima, Toshifumi; and Yamashita, Kiyoshi, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic light-sensitive material. 4,547,458, Cl. 430-505.000.
Iijima, Yoshitaka; Uno, Takaaki; and Watanabe, Mitsuru, to Nissan Motor Company, Limited. Differential gear housing supporting apparatus. 4,546,848, Cl. 180-312.000.
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Iizuka, Eiichi; Sando, Tomoji; and Kashima, Shinji, to Showa Denko Kabushiki Kaisha. Method for growing diamond crystals. 4,547,257, Cl. 156-603.000.
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Ilyes, Zoltan: *See—*
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Im, Kwan H.; and Ahluwalia, Rajesh K., to United States of America, Energy. Flue gas desulfurization. 4,547,351, Cl. 423-242.000.
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Imperial Chemical Industries PLC: *See—*
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Jackson, Graham V.; and Meredith, William N., 4,547,469, Cl. 501-84.000.
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Inaba, Kazuo: *See—*
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Indian Industries, Inc.: *See—*
Smith, Max D., 4,546,754, Cl. 124-86.000.
Indianapolis Center for Advanced Research, Inc. (ICFAR): *See—*
Eggleton, Reginald C.; and Fry, Francis J., 4,546,771, Cl. 128-660.000.
Industrie Pirelli S.p.A.: *See—*
Tangorra, Giorgio; Robecchi, Edoardo; and Magnabosco, Lino, 4,547,175, Cl. 464-56.000.
Information International, Inc.: *See—*
Waller, Robert W.; and Anschultz, Dean W., 4,547,812, Cl. 358-283.000.
Inglis, Hal L.: *See—*
Smith, Robert P.; Gillespie, William S.; Inglis, Hal L.; and Hoyne, Donald B., 4,547,645, Cl. 219-10.670.
Ingram, Alvin R., to Atlantic Richfield Company. Impregnation suspension system for expandable styrene/maleic anhydride particles. 4,547,527, Cl. 521-60.000.
Inmont Corporation: *See—*
Panush, Sol; Gelmini, James M.; and Varcak, David M., 4,547,410, Cl. 427-388.200.
Inoki, Yoshihiro: *See—*
Hattori, Yasuo; Morita, Hideo; and Inoki, Yoshihiro, 4,547,560, Cl. 526-340.000.
Inoue, Hiroshi: *See—*
Okamoto, Yoshio; Iwai, Kazumi; Inoue, Hiroshi; Kunugi, Yoshifumi; and Shinozaki, Tadashi, 4,546,795, Cl. 137-624.150.
Inoue, Masuo: *See—*
Terano, Minoru; Soga, Hirokazu; Inoue, Masuo; and Miyoshi, Katsuyoshi, 4,547,476, Cl. 502-127.000.
Inoue, Noriyuki: *See—*
Maeda, Minoru; Iwasaki, Masayuki; Inoue, Noriyuki; and Totsuka, Mikio, 4,547,450, Cl. 430-202.000.
Institute fur Textilund Faserforschung: *See—*
Planck, Heinrich; and Joas, Wolfgang, 4,546,769, Cl. 128-335.500.
Intel Corporation: *See—*
Reese, Edmund A.; Spaderna, Dieter W.; and Flannagan, Stephen T., 4,547,867, Cl. 365-189.000.
Interior Steel Equipment Co.: *See—*
French, Robert J.; and Dorony, Elmer F., 4,547,026, Cl. 312-201.000.
InterMetro Industries Corporation: *See—*
Cohn, Robert J., 4,546,887, Cl. 211-49.100.
International Business Corporation: *See—*
Bond, Paul W.; and Rockrohr, James D., 4,547,710, Cl. 315-403.000.
International Business Machines Corporation: *See—*
Anantha, Narasipur G.; Riseman, Jacob; and Tsang, Paul J., 4,546,536, Cl. 29-571.000.
Bergeron, David L., 4,547,793, Cl. 357-50.000.
Best, John S.; Lee, Kenneth; and Tsang, Ching H., 4,547,824, Cl. 360-113.000.
Bialas, John S., Jr.; Daniels, Richard J.; and Mruk, William J., 4,547,682, Cl. 307-297.000.
Jain, Kantilal; and Latta, Milton R., 4,547,044, Cl. 350-433.000.
Klaassen, Klaas B., 4,547,817, Cl. 360-29.000.
Shattuck, Meredith D., 4,547,088, Cl. 400-241.100.
Shepard, Joseph F., 4,546,535, Cl. 29-571.000.
Thorne, William D.; and Sedgwick, David M., 4,546,699, Cl. 101-93.140.
International Coal Refining Co.: *See—*
Tewari, Krishna C.; and Foster, Edward P., 4,547,201, Cl. 44-51.000.
International Flavors & Fragrances Inc.: *See—*
Light, Kenneth K.; Schreiber, William L.; McGhie, Joseph A.; Schreck, Ronald P.; Yoshida, Takao; Schreiber, Loren B.; and Muralidhara, Ranya, 4,547,594, Cl. 568-392.000.
International Osobouw Sales Office N.V.: *See—*
Batstra, Ype, 4,547,331, Cl. 264-333.000.
International Standard Electric Corporation: *See—*
Colardelle, Joel S. G., 4,547,863, Cl. 364-784.000.
Pansaerts, Marcel F. R.; Bogaert, Joseph M. F.; and Decolvenaer, Etienne K. A., 4,547,835, Cl. 361-399.000.
Pedersen, Jack R.; Thomassen, Hans R.; and Henriksen, Svein, 4,547,626, Cl. 174-107.000.
Szechenyi, Kalman, 4,547,633, Cl. 179-175.30F.
International Telephone & Telegraph Corp.: *See—*
Espiritu, Hermenegildo A., 4,547,035, Cl. 339-103.00M.
Nguyen, Van H., 4,546,641, Cl. 73-32.00A.
Intersil, Inc.: *See—*
Bingham, David, 4,547,683, Cl. 307-355.000.
Intertechnique: *See—*
Beaussant, Raymond, 4,546,491, Cl. 2-2.10A.
Invacare Corporation: *See—*
Gerber, James A., 4,546,764, Cl. 128-33.000.
Isaacs, Michael S.: *See—*
Blacksberg, Richard; and Isaacs, Michael S., 4,547,168, Cl. 446-222.000.
Isenberg, Arnold O.; Ruka, Roswell J.; and Zymboly, Gregory E., to Westinghouse Electric Corp. Protective interlayer for high temperature solid electrolyte electrochemical cells. 4,547,437, Cl. 429-30.000.
Isert, Hugo. Guide bearing for a linear body. 4,547,025, Cl. 308-6.00C.
Isherwood, David P.; and Younan, Hany R., to National Research Development Corporation. Impact testing machine. 4,546,654, Cl. 73-844.000.
Ishibashi, Kenzo: *See—*
Suzuki, Takeomi; Ishibashi, Kenzo; and Hashimoto, Isamu, 4,547,676, Cl. 250-578.000.
Ishida, Toshihiko: *See—*
Okamura, Masatoshi; and Ishida, Toshihiko, 4,546,936, Cl. 242-198.000.
Ishida, Tsuyoshi: *See—*
Ohtombe, Ko; Ishida, Tsuyoshi; Osawa, Hideo; and Nagahashi, Kenji, 4,547,896, Cl. 382-7.000.
Ishikawa, Hiromichi: *See—*
Kaneko, Kimiyoshi; Ishikawa, Hiromichi; Moriyama, Satoru; and Uchiyama, Tsugio, 4,547,524, Cl. 514-594.000.
Iso, Tadashi: *See—*
Iwao, Jun-ichi; Iso, Tadashi; and Oya, Masayuki, 4,547,513, Cl. 514-321.000.
Ison, Deborah K., to Deserdein, Incorporated. Bedding assembly. 4,546,508, Cl. 5-494.000.
Isoshima, Kazumi: *See—*
Kojima, Akira; Yoshida, Saburo; Yamada, Yoshio; Shioda, Seiji; and Isoshima, Kazumi, 4,547,423, Cl. 428-315.500.
Isotronics, Inc.: *See—*
Tower, Steven A.; and Greenspan, Jay S., 4,547,624, Cl. 174-52.0FP.
Isoyama, Eizo: *See—*
Ejima, Tatsuhiko; Arai, Kozo; Isoyama, Eizo; and Fujihira, Tadao, 4,547,275, Cl. 204-129.750.
Itakura, Tomiya: *See—*
Kamifuji, Hiroshi; Ito, Tomoo; Kobayashi, Haruhiko; and Itakura, Tomiya, 4,547,852, Cl. 364-431.040.
Itakura, Yasushi: *See—*
Ohno, Akira; Itakura, Yasushi; Tabe, Takayuki; and Hiromoto, Shuji, 4,546,958, Cl. 267-47.000.
Itami, Teruhiko: *See—*
Yamasawa, Akira; Itami, Teruhiko; and Kimoto, Toshifumi, 4,547,782, Cl. 346-74.400.
Ito, Akio; and Ito, Masao, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Method for producing capillary nibs for inscribing instruments. 4,547,244, Cl. 156-167.000.
Ito, Masao: *See—*
Ito, Akio; and Ito, Masao, 4,547,244, Cl. 156-167.000.
Ito, Tomoo: *See—*
Kamifuji, Hiroshi; Ito, Tomoo; Kobayashi, Haruhiko; and Itakura, Tomiya, 4,547,852, Cl. 364-431.040.
Ito, Yasunobu: *See—*
Hayakawa, Yoichi; Yokoyama, Shoji; and Ito, Yasunobu, 4,547,178, Cl. 474-11.000.
Ito, Yo: *See—*
Shibuya, Kiyoshi; Yukumoto, Masao; Kan, Takahiro; and Ito, Yo, 4,546,814, Cl. 164-455.000.
ITT Corporation: *See—*
Scheibenreif, John A., 4,547,027, Cl. 339-8.00R.
ITT Industries, Inc.: *See—*
Flamm, Peter M., 4,547,763, Cl. 340-347.0CC.
Iwai, Kazumi: *See—*
Okamoto, Yoshio; Iwai, Kazumi; Inoue, Hiroshi; Kunugi, Yoshifumi; and Shinozaki, Tadashi, 4,546,795, Cl. 137-624.150.
Iwao, Jun-ichi; Iso, Tadashi; and Oya, Masayuki, to Santen Pharmaceutical Co., Ltd. 2-Arylbenzothiazoline derivatives and their use in treating angina cordis. 4,547,513, Cl. 514-321.000.

Iwasaki, Masayuki: *See—*
Maeda, Minoru; Iwasaki, Masayuki; Inoue, Noriyuki; and Totsuka, Mikio, 4,547,450, Cl. 430-202.000.
Iwase, Seiichiro; Asaida, Takashi; and Nagumo, Fumio, to Sony Corporation. Digital color video signal encoder. 4,547,796, Cl. 358-13.000.
Iwashita, Kiyoji: *See—*
Watanabe, Ryuji; Iwashita, Kiyoji; Tomita, Sadami; Kuniya, Keiichi; and Tsuda, Hideaki, 4,547,639, Cl. 200-144.00B.
Iwata, Kouki: *See—*
Moriya, Kouichi; Iwata, Kouki; and Takefuta, Hideyasu, 4,546,736, Cl. 123-179.00G.
Iwatsuki, Shouji, to Daikin Kogyo Company Limited. Fluoroacrylic copolymer. 4,547,558, Cl. 526-245.000.
Iyimen, Siddik: *See—*
Moller, Erwin; and Iyimen, Siddik, 4,547,379, Cl. 426-281.000.
Izumi, Masayoshi: *See—*
Sumiyoshi, Kikuo; Sato, Eiji; Kojima, Masamitsu; Izumi, Masayoshi; and Miyasaka, Kingo, 4,547,434, Cl. 428-609.000.
J. C. Pitman Company, Inc.: *See—*
Bellerose, Richard J., 4,546,684, Cl. 83-355.000.
J. I. Case Company: *See—*
Hanson, Charles B., 4,546,996, Cl. 280-764.100.
Mylander, Richard H., 4,546,664, Cl. 74-473.00R.
J. M. Voith GmbH: *See—*
Rohde, Gunter; Holzinger, Dieter; and Grossmann, Udo, 4,546,930, Cl. 242-56.00R.
Jackson, David M., to Kimberly-Clark Corporation. Sanitary napkin with malodor counteractant means. 4,547,195, Cl. 604-359.000.
Jackson, Ernest V.: *See—*
Martin, Alan B.; and Jackson, Ernest V., 4,546,829, Cl. 166-267.000.
Jackson, G. C., Jr.: *See—*
Dennis, James G.; Bramlett, Kenneth W.; and Jackson, G. C., Jr., 4,546,836, Cl. 175-107.000.
Jackson, Graham V.; and Meredith, William N., to Imperial Chemical Industries PLC. Inorganic foams. 4,547,469, Cl. 501-84.000.
Jackson, Keith L.; Benner, Eugene L.; Polley, Richard B.; and Wickman, James J., to Lukens General Industries, Inc. Equipment mounting structure for inside bearing railway car trucks. 4,546,706, Cl. 105-182.00E.
Jackson, Samuel G. Fan impeller with flexible blades. 4,547,126, Cl. 416-132.00A.
Jacob, Frederick W.: *See—*
Cook, John E.; Hagerty, Robert O.; and Jacob, Frederick W., 4,547,555, Cl. 526-60.000.
Jacobs, Barry A.; and Reale, Michael J., to Stauffer Chemical Company. Method of preventing scorch in a polyurethane foam and product thereof. 4,547,528, Cl. 521-121.000.
Jaeger, Ben E. Force gauge. 4,546,657, Cl. 73-862.580.
Jagdmann, Gunnar E., Jr.: *See—*
Turnbull, Lennox B.; Donohue, John A.; and Jagdmann, Gunnar E., Jr., 4,547,518, Cl. 514-403.000.
Jahnke, Frederick C., to Texaco Development Corporation. Combination with a high temperature combustion chamber and top burner. 4,547,145, Cl. 431-76.000.
Jahnke, Frederick C., to Texaco Development Corporation. Partial oxidation process. 4,547,203, Cl. 48-197.00R.
Jahr, Lennart; and Wickstrom, Sven, to OSA AB. Device for rotator and grapple unit suspended at a boom end. 4,546,805, Cl. 144-34.00R.
Jain, Kantilal; and Latta, Milton R., to International Business Machines Corporation. Beam-folding wedge tunnel. 4,547,044, Cl. 350-433.000.
Jakahi, Douglas Y. Fixed position concentrating solar collector. 4,546,757, Cl. 126-438.000.
Jakovlev, Vladimir: *See—*
Oepen, Gerhard; Engel, Jurgen; Jakovlev, Vladimir; and Thiemer, Klaus, 4,547,505, Cl. 514-255.000.
Jalil, Asjed A.; Winslow, Earl S., Jr.; and Gage, Charles H., to Morgan Construction Company. Apparatus for combined hot rolling and treating steel rod. 4,546,957, Cl. 266-106.000.
James, Claude: *See—*
Fabre, Jean-Louis; Farge, Daniel; James, Claude; and Lave, Daniel, 4,547,504, Cl. 514-255.000.
James, Larry R.: *See—*
Busboom, Garry W.; and James, Larry R., 4,546,600, Cl. 56-208.000.
James River - Norwalk, Inc.: *See—*
Kuchenbecker, Morris W., 4,546,884, Cl. 206-611.000.
Japan Synthetic Rubber Co., Ltd.: *See—*
Shinohara, Hironobu; Kubota, Kiyonobu; and Yoshida, Yoshinori, 4,547,200, Cl. 44-51.000.
Japka, Joseph E.: *See—*
Girrell, Carol A.; and Japka, Joseph E., 4,547,228, Cl. 148-16.000.
Jarnuszkiewicz, Marek: *See—*
Jarnuszkiewicz, Stanislaw; and Jarnuszkiewicz, Marek, 4,546,751, Cl. 123-568.000.
Jarnuszkiewicz, Stanislaw; and Jarnuszkiewicz, Marek, to Politechnika Krakowska. Method of preparing a combustible mixture in an internal combustion piston engine. 4,546,751, Cl. 123-568.000.
Jasmin, Claude: *See—*
Chermann, Jean-Claude; Jasmin, Claude; and Mathe, Georges, 4,547,369, Cl. 424-131.000.
Jasne, Stanley J.; Schwarzel, William C.; Sullivan, Charles I.; and Taylor, Lloyd D., to Polaroid Corporation, Patent Dept. Hydrolyzable diffusion control layers in photographic products. 4,547,451, Cl. 430-215.000.
Jautelat, Manfred: *See—*
Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Reinecke, Paul; and Scheinpflug, Hans, 4,547,515, Cl. 514-383.000.
Jaworski, Eugene; and Breslow, Jeffrey D., to Marvin Glass & Associates. Toy vehicle claw wheel. 4,547,173, Cl. 446-457.000.
Jenison, Richard B. Coaster with removable support plate. 4,546,946, Cl. 248-346.100.
Jenkins, Lawrence F.: *See—*
Larson, Jay M.; Jenkins, Lawrence F.; and Belmore, James E., 4,547,229, Cl. 148-134.000.
Jenkins, Walter N., to National Research Development Corporation. Arc deposition of metal onto a substrate. 4,547,391, Cl. 427-37.000.
Jensen, Ernst: *See—*
Ballreich, Kurt; Jensen, Ernst; and Knappworst, Jurgen, 4,546,704, Cl. 102-444.000.
Jeol Ltd.: *See—*
Nakagawa, Seiichi; and Norioka, Setsuo, 4,547,669, Cl. 250-310.000.
Jidosha Kiki Company, Limited: *See—*
Kobayashi, Michio; and Tsuyuki, Yasuo, 4,546,691, Cl. 91-376.00R.
Koike, Ichiro, 4,546,786, Cl. 137-117.000.
Joas, Wolfgang: *See—*
Planck, Heinrich; and Joas, Wolfgang, 4,546,769, Cl. 128-335.500.
Johannes Heidenhain GmbH: *See—*
Ernst, Alfons, 4,547,772, Cl. 340-686.000.
John Wyeth & Brother Ltd.: *See—*
Crossley, Roger, 4,547,510, Cl. 514-311.000.
Johnson, James W.: *See—*
Burns, Edgar A.; and Johnson, James W., 4,547,032, Cl. 339-90.00R.
Johnson, Lynville G.; and Elliott, James O., to General Motors Corporation. Vehicle windshield cleaner control. 4,547,716, Cl. 318-443.000.
Johnson, Marvin F. L., to Atlantic Richfield Company. Methane conversion using a silica/magnesia support. 4,547,608, Cl. 585-500.000.
Johnson, Marvin M.; and McDaniel, Max P., to Phillips Petroleum Company. Polyphosphate in chromium catalyst support. 4,547,479, Cl. 502-155.000.
Johnson, Robert R.: *See—*
Avellino, Frank J.; and Johnson, Robert R., 4,547,891, Cl. 377-16.000.
Johnson, Robert W.: *See—*
Naccarato, Peter D.; and Johnson, Robert W., 4,547,100, Cl. 407-39.000.
Jones, Arfon H.; and Cutler, Raymond A., to Terra Tek, Inc. Hollow proppants and a process for their manufacture. 4,547,468, Cl. 501-33.000.
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., to Atlantic Richfield Company. Methane conversion process. 4,547,607, Cl. 585-500.000.
Jones, C. Andrew; and Sofranko, John A., to Atlantic Richfield Company. Methane conversion. 4,547,611, Cl. 585-500.000.
Jones, David E., to Mead Corporation, The. Apparatus and method for drop deflection. 4,547,785, Cl. 346-1.100.
Jones, Gregory A. Animated toy. 4,546,562, Cl. 40-591.000.
Jones, Martin; and Young, Rodney C., to Smith Kline & French Laboratories Limited. 2-(Imidazolyl alkylamino)-3-carboxy(or hydroxy)-pyridines. 4,547,512, Cl. 514-341.000.
Jones, Nelson E., to United States of America, Air Force. Sonic flow plate. 4,547,884, Cl. 372-58.000.
Jones, Richard P. Distress light and signal system. 4,547,761, Cl. 340-331.000.
Jones, Thomas N., to Renosol Corporation. Reinforced plastic baseball bat with superior handle section. 4,546,976, Cl. 273-72.00R.
Joos, Bernhard. Preparation for strengthening, particularly hardening, living finger nails. 4,547,363, Cl. 424-61.000.
Josefowicz, Jack Y., to Atlantic Richfield Company. Method and apparatus for production of a metal from metallic oxide ore using a composite anode. 4,547,272, Cl. 204-67.000.
Josefowicz, Jack Y.: *See—*
Rowlette, John J.; Clough, Thomas J.; Josefowicz, Jack Y.; and Sibert, John W., 4,547,443, Cl. 429-217.000.
Josserand, Michel: *See—*
Maerfeld, Charles; Josserand, Michel; and Gragnolati, Claude, 4,547,870, Cl. 367-155.000.
Josyula, Bhagavan V.; and Spector, George. File fasteners. 4,547,091, Cl. 402-12.000.
Jourdain, Gerard E. A.: *See—*
Bouiller, Jean G.; Buisson, Marc F. B.; Jourdain, Gerard E. A.; Sandelis, Denis J. M.; and Urruty, Yves R. A., 4,546,606, Cl. 60-262.000.
Juaire, Michael P.: *See—*
Larsen, Theodore E.; and Juaire, Michael P., 4,547,673, Cl. 250-554.000.
Jun, Mong-Jon: *See—*
Hoffmann, Gerhard; Bronstert, Bernd; Hahn, Herbert; and Jun, Mong-Jon, 4,547,454, Cl. 430-271.000.
Jung, Frederic H.; Olivier, Annie A.; and Loftus, Frank, to ICI Pharma; and Imperial Chemical Industries PLC. Process for preparing cephalosporin derivatives. 4,547,573, Cl. 544-27.000.
Jung, Werner; and Purzycki, Alfred Z., to AT&T Teletype Corporation. Guide for a print head of a printing device. 4,547,089, Cl. 400-354.000.
Junghans, Rudi, to Heidelberger Druckmaschinen AG. Inking unit for printing presses. 4,546,701, Cl. 101-349.000.

Junkosha Company, Ltd.: *See*—
Suzuki, Hirosuke, 4,547,424, Cl. 428-316.600.
Juurmaa, Kimmo: *See*—
Collins, Geoff; and Juurmaa, Kimmo, 4,546,719, Cl. 114-40.000.
Kaarre, Norman J.: *See*—
Melnyk, William; and Kaarre, Norman J., 4,546,825, Cl. 165-159.000.
Kabushiki Kaisha Daikin Seisakusho: *See*—
Kamio, Takenori, 4,546,866, Cl. 192-107.00C.
Kabushiki Kaisha Daini Seikosha: *See*—
Sanuki, Sannosuke; and Morikawa, Hideyuki, 4,547,340, Cl. 422-116.000.
Kabushiki Kaisha Furukawa Seisakusho: *See*—
Yasumune, Masaru; Yamada, Junsaku; and Kurokawa, Sumiaki, 4,546,595, Cl. 53-450.000.
Kabushiki Kaisha Meidensha: *See*—
Kashimoto, Yutaka; Kano, Masayuki; and Fukai, Toshimasa, 4,547,638, Cl. 200-144.00B.
Kashiwagi, Yoshiyuki; Sano, Takamitsu; and Kitakizaki, Kaoru, 4,547,640, Cl. 200-144.00B.
Tanigaki, Shuzo; Yasuda, Tomio; and Sakaki, Masayuki, 4,547,769, Cl. 340-626.000.
Kabushiki Kaisha Morita Seisakusho: *See*—
Arai, Eiichi, 4,547,687, Cl. 310-58.000.
Kabushiki Kaisha Ohmori Seisakusho: *See*—
Ohmori, Hatsutaro, 4,546,932, Cl. 242-84.21R.
Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
Kanada, Shigeyasu; Mizuno, Shigeo; Nakano, Yoshio; and Nishimura, Yuji, 4,546,933, Cl. 242-107.000.
Mizuno, Shigeo; Kubota, Kazuhisa; and Ichikawa, Takahumi, 4,547,636, Cl. 200-61.540.
Nishimura, Yuji; Fujiwara, Akinori; Kawaguchi, Teruhiko; Shimogawa, Toshiaki; and Sakakibara, Kazuo, 4,546,934, Cl. 242-107.000.
Kabushiki Kaisha Toshiba: *See*—
Watanabe, Junji, 4,547,783, Cl. 346-76.0PH.
Kadomatsu, Seiji; and Misumi, Kozo, to Osaka Soda Co., Ltd. Afterchlorinated ethylene/butene-1 copolymer and process for its production. 4,547,554, Cl. 525-334.100.
Kaizer, Adrianus J. M.: *See*—
Nieuwendijk, Joris A. M.; Sanders, Georgius B. J.; van Dijk, Cornelis D.; and Kaizer, Adrianus J. M., 4,547,631, Cl. 179-115.50R.
Kako, Hiroyuki: *See*—
Shibata, Takanori; Yamanaka, Masashige; and Kako, Hiroyuki, 4,547,543, Cl. 524-264.000.
Kalinowski, Robert E.: *See*—
Graiver, Daniel; and Kalinowski, Robert E., 4,547,312, Cl. 252-513.000.
Kamhi, Victor M., to American Cyanamid Company. Poly(ethyleneoxy)-substituted-9,10-bis(phenylethynyl)anthracene mixtures. 4,547,317, Cl. 252-700.000.
Kamifuji, Hiroshi; Ito, Tomoo; Kobayashi, Haruhiko; and Itakura, Tomiya, to Hitachi, Ltd.; and Hitachi Automotive Eng. Co., Ltd. Engine control apparatus and control method. 4,547,852, Cl. 364-431.040.
Kamino, Yukishige: *See*—
Uchida, Kenji; Sakamoto, Masakatsu; Saito, Makoto; Kamino, Yukishige; and Miyadera, Hiroshi, 4,547,132, Cl. 417-63.000.
Kaminski, Walter R.; and Scalise, Stanley J., to United Technologies Corporation. Catalyzed sealed-off CO_2 laser. 4,547,886, Cl. 372-59.000.
Kamio, Takayoshi; Ohga, Kunihiko; and Mukunoki, Yasuo, to Fuji Photo Film Co., Ltd. Photographic silver halide materials containing a high speed coating aid. 4,547,459, Cl. 430-631.000.
Kamio, Takenori, to Kabushiki Kaisha Daikin Seisakusho. Cushioning plate assembly of a clutch disc. 4,546,866, Cl. 192-107.00C.
Kamyr, Inc.: *See*—
Sherman, Michael I.; and Phillips, Joseph R., 4,547,264, Cl. 162-37.000.
Kan, Takahiro: *See*—
Shibuya, Kiyoshi; Yukumoto, Masao; Kan, Takahiro; and Ito, Yo, 4,546,814, Cl. 164-455.000.
Kanada, Shigeyasu; Mizuno, Shigeo; Nakano, Yoshio; and Nishimura, Yuji, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Webbing retractor. 4,546,933, Cl. 242-107.000.
Kanamori, Chiemi: *See*—
Nakajima, Sadahiro; Kanamori, Chiemi; and Toratani, Hisayoshi, 4,547,402, Cl. 427-169.000.
Kanbe, Junichiro: *See*—
Shirai, Shigeru; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Misumi, Teruo, 4,547,448, Cl. 430-84.000.
Kanda, Zensho: *See*—
Ichikawa, Toshiji; Ohhachi, Yoshinori; and Kanda, Zensho, 4,547,191, Cl. 604-251.000.
Kane, Steven E.: *See*—
Avidan, Amos A.; Gould, Ronald M.; and Kane, Steven E., 4,547,616, Cl. 585-640.000.
Kaneko, Kimiyoshi; Ishikawa, Hiromichi; Moriyama, Satoru; and Uchiyama, Tsugio, to Hokko Chemical Industry Co., Ltd. Insecticidal benzoyl hydrazone derivatives. 4,547,524, Cl. 514-594.000.
Kaneko, Shuzo; and Tamura, Yasuyuki, to Canon Kabushiki Kaisha. Image forming apparatus with displaying and printing functions. 4,547,787, Cl. 346-160.000.
Kaneko, Siyoukichi: *See*—
Nagasaka, Syuichi; and Kaneko, Siyoukichi, 4,546,726, Cl. 118-719.000.
Kano, Masayuki: *See*—
Kashimoto, Yutaka; Kano, Masayuki; and Fukai, Toshimasa, 4,547,638, Cl. 200-144.00B.
Kantor, Frederick W. Instrumentation and control system and method for fluid transport and processing. 4,546,649, Cl. 73-168.000.
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Tanaka, Kunihiro; and Futagami, Nobuhiro, 4,547,146, Cl. 431-180.000.
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Barth, Edward G.; Braude, Ruvim; and Kay, Nicholas W., 4,547,467, Cl. 501-20.000.
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Keating, Kenneth P.: *See*—
Sanderson, John R.; Keating, Kenneth P.; Marquis, Edward T.; and Vanderpool, Steven H., 4,547,598, Cl. 568-922.000.
Kecala, Ihor G. Exercise bench. 4,546,967, Cl. 272-93.000.
Keene Corporation: *See*—
Cea, Michael S., 4,546,944, Cl. 248-219.200.

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Greiner, Ulrich; Keil, Karl-Heinz; Heinrich, Rudolf; and Albrecht, Konrad, 4,547,429, Cl. 428-402.240.
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Carr, Jesse M., Jr.; Sheler, Raymond E.; Richards, Frank J.; and Kelder, Eric, 4,547,295, Cl. 210-777.000.
Keller, Martin B.; and Ahrens, Roger A., to Sandy Hill Corporation. Apparatus for providing selectively differentiated vacuum across a papermaking machine width. 4,547,266, Cl. 162-252.000.
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McArthur, William J.; and Kelm, Roger W., 4,547,438, Cl. 429-82.000.
Kelrack Limited: *See*—
Knott, Michael W., 4,546,979, Cl. 273-153.00S.
Kelsey-Hayes Company: *See*—
Rozmus, Walter J., 4,547,337, Cl. 419-49.000.
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Wang, Da Y.; and Kennedy, Daniel T., 4,547,281, Cl. 204-424.000.
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Kennedy, William R.; and Kennedy, John M., 4,547,094, Cl. 405-132.000.
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Lundin, Claes O. A.; and Simonsson, Berit I., 4,547,481, Cl. 502-160.000.
Kern, Hans: *See*—
Heider, Ulrich; and Kern, Hans, 4,547,087, Cl. 400-144.200.
Kerotest Manufacturing Corp.: *See*—
Tremblay, Richard P., 4,546,662, Cl. 74-18.100.
Kerouanton, Alain: *See*—
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Kerwin, John M., to Marblehead Lime Company. Apparatus and method for incinerating waste material with a converted preheater-type lime kiln. 4,546,711, Cl. 110-246.000.
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Kiefer, Walter J., Jr., 4,546,676, Cl. 81-58.100.
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Kikkoman Corporation: *See*—
Takeuchi, Itsuo; Yokoshima, Teruaki; Tabata, Noboru; Fujita, Eishin; Nagata, Koshiro; and Kishimoto, Tetsuya, 4,547,372, Cl. 426-11.000.
Kikuchi, Takehiro: *See*—
Kobayashi, Akio; Harada, Susumu; Harada, Takashi; Kikuchi, Takehiro; and Honda, Masakazu, 4,546,747, Cl. 123-489.000.
Kilbourn, Frederick A.: *See*—
Houle, Raymond T.; Kilbourn, Frederick A.; De Kraker, James E.; and Nilsson, Robert T., 4,546,506, Cl. 4-555.000.
Kim, Chang J., to Exxon Research and Engineering Co. Reducing methane production in Fischer-Tropsch reactions. 4,547,525, Cl. 518-713.000.
Kim, Yoon H. Cosmetic towel. 4,546,516, Cl. 15-210.00R.
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Jackson, David M., 4,547,195, Cl. 604-359.000.
Kime, James A., to Hydro-Horse, Inc. Pumping apparatus. 4,546,607, Cl. 60-372.000.
Kimoto, Toshifumi: *See*—
Yamasawa, Akira; Itami, Teruhiko; and Kimoto, Toshifumi, 4,547,782, Cl. 346-74.400.
Kimura, Takashi, to Canon Kabushiki Kaisha. Detachably connectible video camera video recorder. 4,547,815, Cl. 358-335.000.
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Kinkori, Shuzo: *See*—
Fukami, Yasuhiko; Sawada, Toshiichi; and Kinkori, Shuzo, 4,546,733, Cl. 123-52.0MB.
Kino, Moriya, to Royal Co., Ltd. Sound producing toy. 4,547,172, Cl. 446-421.000.
Kinoshita, Takao: *See*—
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Kiraly, Ernest F.; and Ferraro, Frank A., to Warner-Lambert Company. One-piece disposable razor with blade protector latched releasably to razor. 4,546,544, Cl. 30-90.000.
Kirchhan, James J. Container and sealing enclosure. 4,546,874, Cl. 220-4.00B.
Kiryu, Kyuji; and Aizawa, Kensuke, to Tokico, Ltd. Industrial robot having a sensor unit. 4,546,724, Cl. 118-669.000.
KIS France: *See*—
Thebault, Claude, 4,547,065, Cl. 355-28.000.
Kiselev, Igor V.: *See*—
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Kishner, Stanley J.; and Park, Ernest D., to Kollmorgen Technologies Corporation. Method and apparatus for sensing and maintaining color registration. 4,546,700, Cl. 101-211.000.
Kitagawa Industries Co., Ltd.: *See*—
Eguchi, Kanemitsu, 4,547,414, Cl. 428-36.000.
Kitagawa, Keishi: *See*—
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Kitagishi, Nozomu; Yamaguchi, Shin; Sakai, Shinji; Kinoshita, Takao; Kawabata, Takashi; Shinoda, Nobuhiko; and Hosoe, Kazuya, to Canon Kabushiki Kaisha. Focus detecting apparatus with a compensation mask. 4,547,663, Cl. 250-201.000.
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Kitamoto, Tatsuji: *See*—
Asai, Takamitsu; Kitamoto, Tatsuji; and Akashi, Goro, 4,547,393, Cl. 427-48.000.
Kitamura, Koichiro, to Kitamura Machinery Co., Ltd. Automatic tool changing apparatus. 4,546,532, Cl. 29-568.000.
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Kitamura, Koichiro, 4,546,532, Cl. 29-568.000.
Kitano, Noritoshi: *See*—
Ide, Junya; Muramatsu, Shigeki; Nakada, Yasuo; and Kitano, Noritoshi, 4,547,520, Cl. 514-450.000.
Kiyota, Hideharu; and Horiuchi, Mitsuaki, to Hitachi, Ltd. Sputtering apparatus. 4,547,279, Cl. 204-298.000.
Klaassen, Klaas B., to International Business Machines Corporation. High frequency magnetic recording method. 4,547,817, Cl. 360-29.000.
Kleger, Ferdinand; and Zeller, Hans, to Perfekta Maschinenbau Ferdinand Kleger AG. Apparatus for cutting out flat goods or structures applied to a base fabric. 4,546,546, Cl. 30-273.000.
Klein, Christiane: *See*—
Dumont, Bernard; Proponet, Christian; Bancelin, Bernard; Brucker, Roland; Bories, Jean-Louis; and Klein, Christiane, 4,547,834, Cl. 361-386.000.
Kleintjens, Ludovicus A. L.; and Grooten, Hubertus M. J., to Stamicarbon B.V. Process for the preparation of pharmaceutical benzoic acid. 4,547,587, Cl. 562-494.000.
Kliatzkin, Vladimir; Krimerman, Joseph; and Mayraz, Eliezer. Impeller for a wind motor. 4,547,124, Cl. 416-86.000.
Kline, Mark L.; and Ross, Oakley G., to General Dynamics Pomona Division. Precooled detector leads. 4,546,614, Cl. 62-62.000.
Kline, Mark L.; and Ross, Oakley G., to General Dynamics, Pomona Division. Cryogenic detector post. 4,546,621, Cl. 62-514.00R.
Klinger AG: *See*—
Huber, Richard; and Wirz, Peter, 4,546,790, Cl. 137-315.000.
Kloetzer, Dietrich; Linde, Karl-Heinz; and Ojust, Klaus, to Henkel KgaA. Preparation of color-stable, light-colored, aqueous salt pastes of wash-active, α-sulfofatty acid esters. 4,547,318, Cl. 260-400.000.
Knappworst, Jurgen: *See*—
Ballreich, Kurt; Jensen, Ernst; and Knappworst, Jurgen, 4,546,704, Cl. 102-444.000.
Knippenberg, Wilhelmus F.: *See*—
Lersmacher, Bernhard; and Knippenberg, Wilhelmus F., 4,547,069, Cl. 356-244.000.
Knott, Michael W., to Kelrack Limited. Movable piece puzzle. 4,546,979, Cl. 273-153.00S.
Knudson, Gary A. Snap-on fastening device and cap assembly for seamed panels. 4,546,586, Cl. 52-469.000.
Kobayakawa, Yohji: *See*—
Hamada, Takaaki; Kobayakawa, Yohji; Nishikawa, Akira; and Kawahara, Manabu, 4,546,857, Cl. 186-37.000.
Kobayashi, Akio; Harada, Susumu; Harada, Takashi; Kikuchi, Takehiro; and Honda, Masakazu, to Nippondenso Co., Ltd. Lean mixture control system using a biased oxygen concentration sensor. 4,546,747, Cl. 123-489.000.
Kobayashi, Haruhiko: *See*—
Kamifuji, Hiroshi; Ito, Tomoo; Kobayashi, Haruhiko; and Itakura, Tomiya, 4,547,852, Cl. 364-431.040.
Kobayashi, Michio; and Tsuyuki, Yasuo, to Jidosha Kiki Company, Limited. Vacuum power servo booster. 4,546,691, Cl. 91-376.00R.
Koch, Klaus: *See*—
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Kocks Technik GmbH & Co.: *See*—
Brauer, Hans; and Leeuwestein, Kurt, 4,546,633, Cl. 72-252.000.

Kodama, Hisashi, to Aisin Seiki Kabushiki Kaisha. Hydraulic valve lifter for variable displacement engine. 4,546,734, Cl. 123-90.160.
Kodama, Naoki; Takeshita, Masatoshi; Suzuki, Ryo; Takeuchi, Teruaki; and Sugita, Yutaka, to Hitachi, Ltd. Magnetic bubble replicator. 4,547,865, Cl. 365-12.000.
Kodera, Masao: *See*—
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Koeble-Smith, Carol: *See*—
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Koewing, James W.: *See*—
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Koh, Takuji: *See*—
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Kohjin Co., Ltd.: *See*—
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Kohno, Masashi: *See*—
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Koide, Hiroshi: *See*—
Igashira, Toshihiko; Sakakibara, Yasuyuki; Abe, Seiko; Koide, Hiroshi; and Shinoda, Kazuo, 4,546,749, Cl. 123-506.000.
Koike, Eishi, to Ozen Corporation. Simplified sound reproducing device. 4,547,873, Cl. 369-65.000.
Koike, Ichiro, to Jidosha Kiki Co., Ltd. Flow control valve. 4,546,786, Cl. 137-117.000.
Koike, Takaharu; and Taira, Akio, to Olympus Optical Co., Ltd. Microscope tube system. 4,547,047, Cl. 350-514.000.
Koinuma, Yutaka; Ikenoya, Yasuo; and Hayashi, Akira, to Honda Giken Kogyo Kabushiki Kaisha. Cooling system. 4,546,843, Cl. 180-229.000.
Koito Seisakusho Co., Ltd.: *See*—
Wakimizu, Yukio, 4,547,838, Cl. 362-211.000.
Kojima, Akira; Yoshida, Saburo; Yamada, Yoshio; Shioda, Seiji; and Isoshima, Kazumi, to Sony Corporation; Seiren Co., Ltd.; and Asahi Kasei Kogyo Kabushiki Kaisha. Textile for clothes. 4,547,423, Cl. 428-315.500.
Kojima, Masamitsu: *See*—
Sumiyoshi, Kikuo; Sato, Eiji; Kojima, Masamitsu; Izumi, Masayoshi; and Miyasaka, Kingo, 4,547,434, Cl. 428-609.000.
Kojima, Yasuo; and Shimada, Fumio, to Konishiroku Photo Industry Co., Ltd. Heat mode recording material and a recording method by the use thereof. 4,547,456, Cl. 430-330.000.
Kolecki, Jerzy W. Power unit for hang-gliders. 4,546,938, Cl. 244-66.000.
Kollmorgen Technologies Corporation: *See*—
Kishner, Stanley J.; and Park, Ernest D., 4,546,700, Cl. 101-211.000.
Langley, Lawrence W.; and Fisher, Robert L., 4,547,713, Cl. 318-254.000.
Komine, Hiroshi: *See*—
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Kondo, Fumitomo: *See*—
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Kojima, Yasuo; and Shimada, Fumio, 4,547,456, Cl. 430-330.000.
Konz, Elmar; and Kruse, Hansjorg, to Hoechst Aktiengesellschaft. 1-Phenylisoquinoline derivatives, pharmaceutical products containing these compounds and their use. 4,547,508, Cl. 514-307.000.
Korsunsky, Iosif, to AMP Incorporated. Chip carrier socket and contact. 4,547,031, Cl. 339-75.00M.
Koshino, Minoru: *See*—
Nishida, Hidehiko; Koshino, Minoru; Tateishi, Terutaka; and Hattori, Akira, 4,547,848, Cl. 364-200.000.
Kosuge, Tokuo: *See*—
Karino, Kimiji; and Kosuge, Tokuo, 4,546,748, Cl. 123-494.000.
Kountz, Kenneth J.; and Erth, Richard A., to Borg-Warner Corporation. Capacity control systems for inverter-driven centrifugal compressor based water chillers. 4,546,618, Cl. 62-201.000.
Kowalik, Ralph M.: *See*—
Schulz, Donald N.; Kowalik, Ralph M.; Bock, Jan; and Maurer, John J., 4,546,784, Cl. 137-13.000.
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Martinko, Matyas; Elekes, Andras; Simon, Kalman; Bohnert, Jozef; Nemeth, Janos; Bole, Karoly; and Ilyes, Zoltan, 4,547,098, Cl. 405-291.000.
Kraftwerk Union Aktiengesellschaft: *See*—
Ebernard, Franck, 4,546,758, Cl. 126-451.000.
Krause, Robert A. Intermodal rail truck and coupling system. 4,547,107, Cl. 410-58.000.
Krebs, Gerd, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Tire loader. 4,547,012, Cl. 294-93.000.
Kreft, Brad W. Hose clamp apparatus. 4,546,524, Cl. 24-274.00R.
Kremer, Frederic B.; and O'Brien, Edward R., III, to Accutome, Inc. Apparatus to measure conical thickness. 4,546,773, Cl. 128-660.000.
Kresge, Charles T.; McWilliams, John P.; Vartuli, James C.; and Nicoletti, Michael P., to Mobil Oil Corporation. Catalyst for alkylation of aromatic hydrocarbons. 4,547,605, Cl. 585-467.000.
Krimerman, Joseph: *See*—
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Krone GmbH: *See*—
Forberg, Horst; and Delakowitz, Bernd, 4,547,034, Cl. 339-97.00P.
Krueger, Dennis L.; and Meyer, Daniel E., to Minnesota Mining and Manufacturing Company. Bicomponent fibers and webs made therefrom. 4,547,420, Cl. 428-229.000.
Krummel, Peter, to Siemens Aktiengesellschaft. Inverter with a load circuit containing a series oscillating circuit and a discharge lamp. 4,547,706, Cl. 315-226.000.
Kruse, Hansjorg: *See*—
Konz, Elmar; and Kruse, Hansjorg, 4,547,508, Cl. 514-307.000.
Kryger, Allen C., to Squirt & Company. Method for aseptic addition of dipeptide of L-phenylalanine and L-aspartic acid to pasteurized drinks and juices and the product resulting therefrom. 4,547,384, Cl. 426-548.000.
Kubo, Keishi: *See*—
Kurisu, Norio; and Kubo, Keishi, 4,547,788, Cl. 346-208.000.
Kubo, Sanae; and Nakamura, Fumiaki, to Shiseido Company Ltd. Waving lotion for cold waving. 4,547,365, Cl. 424-71.000.
Kubota, Kazuhisa: *See*—
Mizuno, Shigeo; Kubota, Kazuhisa; and Ichikawa, Takahumi, 4,547,636, Cl. 200-61.540.
Kubota, Kiyonobu: *See*—
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Kubota Ltd.: *See*—
Fukuda, Masahiro; Okabayashi, Akitoshi; Narahara, Tadashi; Muramatsu, Kenji; Miyazaki, Noriyuki; and Fukushima, Masanori, 4,546,527, Cl. 29-132.000.
Yukishige, Yoshifumi; Toyokuni, Kazuo; and Kuroiwa, Yoshizo, 4,546,840, Cl. 180-169.000.
Kubota, Yuichi: *See*—
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Kuchenbecker, Morris W., to James River - Norwalk, Inc. Tear strip end closure on liquid tight carton. 4,546,884, Cl. 206-611.000.
Kucher, Carl J. Combination toothpick, gum massager, and dental floss holder. 4,546,782, Cl. 132-91.000.
Kudo, Yoshiaki: *See*—
Hamaguchi, Toshiaki; Namikawa, Kazuhira; Goshima, Toshikazu; Nakamura, Mutsuaki; Kuroda, Akio; and Kudo, Yoshiaki, 4,547,545, Cl. 524-269.000.
Kuehnle, Manfred R.: *See*—
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Lutz, Joseph F. Signal demodulation system for wideband FM. 4,547,739, Cl. 329-145.000.

Lynn, Shirley Y.: *See—*
Eaders, Theodore W.; Lynn, Shirley Y.; Findlay, John B.; and Schubert, Richard M., 4,547,461, Cl. 435-17.000.

Lyons, Robert J., to Bilco Company, The. Safety extension for a fixed ladder with an adjustable mount. 4,546,855, Cl. 182-106.000.

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Burr, John, 4,547,693, Cl. 313-270.000.

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Lamiraux, Christian, 4,547,777, Cl. 343-394.000.

M&T Chemicals Inc.: *See—*
Bednarski, John R.; Gitlitz, Melvin H.; and Russo, David A., 4,547,532, Cl. 523-122.000.

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Nally, Robert B.; Akister, James F.; and Ma, Hung S., 4,547,899, Cl. 382-7.000.

Maa, Jer-shen; and Halon, Bernard, to RCA Corporation. Anisotropic etching of aluminum. 4,547,261, Cl. 156-643.000.

Mabe, Atsushi; Shimizu, Shigemi; and Kawano, Akihiro, to Sanden Corporation. Lubricating mechanism for scroll-type fluid displacement apparatus. 4,547,138, Cl. 418-55.000.

Macchi, Carla; and Nicolussi, Franco, to Tecnomare S.p.A. Method for the construction, transportation and site installation of a deep-sea lattice structure. 4,547,095, Cl. 405-206.000.

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MacMillan Bloedel Limited: *See—*
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Van Brunt, Michael K.; and Madle, Peter, 4,547,623, Cl. 174-35.00R.

Mae, Hisao; and Miyauchi, Kazuo, to Toyota Jidosha Kabushiki Kaisha. Fuel injection apparatus for controlling the amount of alcohol and gasoline supplied to a mixed fuel engine. 4,546,732, Cl. 123-1.00A.

Maeda, Hiroshi: *See—*
Celmer, Walter D.; Cullen, Walter P.; Maeda, Hiroshi; and Tone, Junsuke, 4,547,523, Cl. 514-375.000.

Maeda, Minoru; Iwasaki, Masayuki; Inoue, Noriyuki; and Totsuka, Mikio, to Fuji Photo Film Company. Silver halide sensor type polymerizable light-sensitive material. 4,547,450, Cl. 430-202.000.

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Maerfeld, Charles; Josserand, Michel; and Gragnolati, Claude, to Thomson-CSF. Velocity hydrophone. 4,547,870, Cl. 367-155.000.

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Tangorra, Giorgio; Robecchi, Edoardo; and Magnabosco, Lino, 4,547,175, Cl. 464-56.000.

Mahnke, Parker E., to Marcy Gymnasium Equipment Co. Weight type exercising device. 4,546,970, Cl. 272-118.000.

Mahrus, Duraid; and Benitez, Luiz N., to Meal Leve S.A. Industria e Comercio. Method for the manufacture of piston ring inserts by a powder metallurgy technique. 4,547,336, Cl. 419-31.000.

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Maier & Co.: *See—*
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Maiorana, Stefano; Brocchetti, Diego G.; and Piacenza, Giuseppe, to Schiapparelli Farmaceutici S.p.A. 1,5-Benzothiazepines with cardiovascular utility, and pharmaceutical compositions containing them. 4,547,495, Cl. 514-211.000.

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Majima, Osamu; and Honda, Shigemichi, to Sony Corporation. Method for making a transferrable dye medium. 4,547,392, Cl. 427-40.000.

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Malhotra, Sudarshan K.; and Gerwick, B. Clifford, III, to Dow Chemical Company, The. Certain 3-nitro-6-phenoxy-2-pyridyl-oxy-propionates having herbicidal activity. 4,547,218, Cl. 71-94.000.

Maloy, Joseph T.; Leonard, John F.; and Fritts, David H., to United States of America, Air Force. Inert atmosphere transfer vessel. 4,546,897, Cl. 220-277.000.

Malpass, Dennis B.; and Webb, Dale W., to Texas Alkyls, Inc. Organomagnesium solutions of low viscosity. 4,547,477, Cl. 502-153.000.

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Manning, Winton H., to Educational Testing Service. Apparatus and method for Cloze-Elide testing. 4,547,161, Cl. 434-358.000.

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Rothstein, Robert A., 4,547,136, Cl. 417-475.000.

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Marando, Raoul J.: *See—*
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Marathon Electric Manufacturing Corp.: *See—*
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Kerwin, John M., 4,546,711, Cl. 110-246.000.

Marchent, Brian G.; and Foster, Michael R., to Plessey Overseas Ltd. Compass. 4,546,550, Cl. 33-356.000.

Marchesi, Franco, to Rockwell-Rimoldi S.p.A. Sewing machine differential feed. 4,546,717, Cl. 112-313.000.

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Mark, Victor; and Hedges, Charles V., to General Electric Company. Polyester carbonate from branched chain alkylidene dihydric phenol. 4,547,564, Cl. 528-176.000.

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Marquez, Walter: *See—*
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Mars Incorporated: *See—*
Dean, Robert; Reyner, Peter J.; and Heiman, Frederic P., 4,546,869, Cl. 194-99.000.
French, Jack G., 4,547,709, Cl. 315-378.000.

Martel, Jacques; Tessier, Jean; and Teche, Andre , to Roussel Uclaf. Cyclopropane carboxylic acid derivatives. 4,547,522, Cl. 514-531.000.

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Martin, Alan B.; and Jackson, Ernest V., to Mason & Hanger-Silas Mason Co., Inc. Enhanced oil recovery process. 4,546,829, Cl. 166-267.000.

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Martin, John F.; and Zweifel, Charles H., to Fruehauf Corporation. Adjustable service platform apparatus for a gantry crane. 4,546,852, Cl. 182-12.000.

Martin Saint Leon, Daniel, to Estee Lauder Inc. Method of fabricating container with metal skin. 4,546,529, Cl. 29-455.00R.

Martin, Timothy J.; Page, Bernard T.; and Hooper, Francis H. A., to Lucas Industries Public Limited Company. Automatic adjuster for shoe-drum brake. 4,546,861, Cl. 188-79.5GE.

Martinko, Matyas; Elekes, Andras; Simon, Kalman; Bohnert, Jozef; Nemeth, Janos; Bole, Karoly; and Ilyes, Zoltan, to Kozponti Banyaszati Fejlesztesi Intezet; and Varpalotai Szenbenyak. Mining equipment, mainly for extraction of heavy beds. 4,547,098, Cl. 405-291.000.

Maruyama, Masahiko, to Mitsubishi Denki Kabushiki Kaisha. Laser machining apparatus. 4,547,651, Cl. 219-121.0LG.

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Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Ogren, Dennis F.; Nakaniwa, Mikio; and Furukawa, Kenji, 4,547,284, Cl. 208-50.000.

Marvin Glass & Associates: *See—*
Jaworski, Eugene; and Breslow, Jeffrey D., 4,547,173, Cl. 446-457.000.

Marx, Hans-Norbert, to BASF Aktiengesellschaft. Aqueous wood preservative. 4,547,366, Cl. 424-78.000.

Mary L. Gaines, Corp.: *See—*
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Masaki, Ichiro, to Unimation, Inc. Position detecting method and apparatus. 4,547,800, Cl. 358-107.000.

Maschek, Martin, to BBC Brown, Boveri & Company, Limited. Amplifier circuit with surge suppression. 4,547,742, Cl. 330-149.000.

Maschinenfabrik Sulzer-Ruti AG: *See—*
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Mason & Hanger-Silas Mason Co., Inc.: *See—*
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Mason, John Y.; and Hicks, Bruce W., to Rio Linda Chemical Co., Inc. Dry compositions for the production of chlorine dioxide. 4,547,381, Cl. 426-316.000.
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Fan, John C. C.; and Gale, Ronald P., 4,547,622, Cl. 136-249.000.
Massey, Joe I. Method and apparatus for heating pressure vessel used in tire retreading system. 4,547,241, Cl. 156-96.000.
Masuyama, Masaru; Hirooka, Susumu; and Yamaoka, Nobutatsu, to Taiyo Yuden Co., Ltd. Semiconductive ceramic materials with a voltage-dependent nonlinear resistance. 4,547,314, Cl. 252-520.000.
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Chermann, Jean-Claude; Jasmin, Claude; and Mathe, Georges, 4,547,369, Cl. 424-131.000.
Mathur, Pershottam P.; and Smith, William L., to A. H. Robins Company, Incorporated. Aryloxy-N-(aminoalkyl)-1-pyrrolidine and piperidine carboxamides and carbothioamides having antiarrhythmic activity. 4,547,514, Cl. 514-327.000.
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Matsumoto, Kenji; Yamamoto, Shoichi; and Hayashi, Jun, to Fuji Photo Film Co. Ltd. Solid-state color imaging device and the preparation of same. 4,547,798, Cl. 358-44.000.
Matsumoto, Michio; and Kitagawa, Kunio, to NEC Corporation. Piezoelectrically driven printing mechanism for dot matrix printers. 4,547,086, Cl. 400-124.000.
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Kugimiya, Koichi, 4,547,073, Cl. 356-371.000.
Ohta, Takeo; Nakamura, Tatsushi; and Akahira, Nobuo, 4,547,875, Cl. 369-275.000.
Sugita, Ryuji; and Kunieda, Toshiaki, 4,547,398, Cl. 427-132.000.
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Maurer, John J.: *See—*
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Maurer, Wilhelm. Method and apparatus for making soft-ice in small quantities. 4,547,076, Cl. 366-244.000.
Maxim, John. Conductive fluid activated devices. 4,547,169, Cl. 446-267.000.
May, Gary A., to American K-9 Container Corporation. Animal transportation container. 4,546,728, Cl. 119-19.000.
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McArthur, William J.; and Kelm, Roger W., to Duracell Inc. Battery assembly. 4,547,438, Cl. 429-82.000.
McCartney, Charles P., Jr., to General Motors Corporation. Extruded compartmentalized container. 4,547,236, Cl. 156-69.000.
McClure, Harry A., to Adtech, Inc. Method of sterilizing a filling machine apparatus. 4,547,339, Cl. 422-26.000.
McCord Heat Transfer Corporation: *See—*
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Melnyk, William, 4,546,824, Cl. 165-153.000.
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McCormack, Wallace, to Credfeld Camtorc Limited. Liquid fuel burner. 4,546,921, Cl. 239-125.000.
McCreedy, Kathleen M.; Pawloski, James C.; Keskkula, Henno; and Yonkers, Edward H., to Dow Chemical Company, The. Miscible polymer blends containing poly(2-alkyl-2-oxazoline). 4,547,530, Cl. 521-139.000.
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McCullough, Robert J., to McCullough Cartwright Pharmaceutical Corp. Large animal speculum holder and battery-powered illuminator. 4,546,761, Cl. 128-6.000.
McDaniel, Max P., to Phillips Petroleum Company. Silica-titania cogel from two-step hydrolysis. 4,547,557, Cl. 526-106.000.
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McDaniel, Thomas I., to Tomahawk Industries, Inc. Vehicle bug deflector. 4,547,013, Cl. 296-1.00S.
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McEntire, Edward E.; Neville, Gordon H.; and Nieh, Edward C. Y., to Texaco, Inc. Nonfuming solder cleansing and fusing fluids. 4,547,304, Cl. 252-79.100.
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McGrane, Eugene W., to Homac Mfg. Company. Transformer bar connector and pedestal bar connector cover. 4,547,627, Cl. 174-138.00F.
McGraw, Cobern E.; Gazzero, Robert; and Christian, David E., to Burroughs Corporation. Apparatus for controlling light distribution in line scan optical imaging systems. 4,547,813, Cl. 358-285.000.
McGugan, John D., to Hunting Oilfield Services (U.K.) Limited. Pipe connectors. 4,547,003, Cl. 285-27.000.
McIver, George W.; Whalen, Barry H.; and Troutman, Bruce L., to TRW Inc. Monolithic fast fourier transform circuit. 4,547,862, Cl. 364-726.000.
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McTaw, Johnnie, Jr. Vent window assembly. 4,546,693, Cl. 98-2.000.
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Jones, David E., 4,547,785, Cl. 346-1.100.
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Mecklenburg, Frank H., to Bird Electronic Corporation. RF Wattmeter. 4,547,728, Cl. 324-95.000.
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Ashman, Arthur; and Bruins, Paul F., 4,547,390, Cl. 427-2.000.
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Meining, Hans; and Hans, Rudiger, to SKF Kugellagerfabriken GmbH. Cage for roller bearings. 4,547,084, Cl. 384-576.000.
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Meno, Frank, to University of Pittsburgh. Method of measurement of Eustachian tube opening and associated apparatus. 4,546,779, Cl. 128-746.000.
Menzel, Klaus R., to Cross Company, The. Mechanical quill having selective braking capability. 4,546,834, Cl. 173-146.000.
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Doherty, James B.; Ashe, Bonnie M.; Finke, Paul E.; Shah, Shrenik K.; Thompson, Kevan R.; and Zimmerman, Morris, 4,547,371, Cl. 514-200.000.
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Hausberg, Hans-Heinrich; Bottcher, Henning; Gottschlich, Rudolf; Seyfried, Christoph; and Minck, Klaus-Otto, 4,547,576, Cl. 546-197.000.
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Frommlet, Hubert; and Hahn, Michael, 4,547,127, Cl. 416-134.00A.
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Michael Hoerauf Maschinenfabrik GmbH & Co KG: *See*—
Clauss, Gerhard, 4,546,911, Cl. 229-5.600.
Mick, Perry J., to Sperry Corporation. Apparatus for color tracking and brightness correction for multi-gun color cathode ray tube display. 4,547,797, Cl. 358-27.000.
Microdot Inc.: *See*—
Berecz, Imre; and Hinton, Dennis L., 4,546,833, Cl. 173-12.000.
Micropore International Limited: *See*—
McWilliams, Joseph A.; and Hughes, John T., 4,546,588, Cl. 52-506.000.
Middleton, Daryl J.; and Grenier, Jodyne I., to Ford Motor Company. Method of making infrared reflective glass sheet-I. 4,547,400, Cl. 427-160.000.
Midland-Ross Corporation: *See*—
Vereecke, Frank J., 4,547,150, Cl. 432-12.000.
Midori Anzen Industry Co., Ltd.: *See*—
Ono, Kazumasa; and Okoshi, Koichi, 4,546,497, Cl. 2-243 00A.
Mieyal, David F.; and Reynard, Peter, to Donn Incorporated. Wall panel system providing resilient joints. 4,546,584, Cl. 52-281.000.
Milch, Robert A.; Guerry-Kopecko, Patricia; Koeble-Smith, Carol; and Sybert, Edward M., to IGI Biotechnology, Inc. Preparation of high fructose syrups from citrus residues. 4,547,226, Cl. 127-41.000.
Milchem Incorporated: *See*—
Lucas, James M., 4,547,299, Cl. 252-8.50C.
Miller, Nicholas E.: *See*—
Campbell, Bryant A.; and Miller, Nicholas E., 4,547,404, Cl. 427-248.100.
Miller, Norbert D.; and LaFleur, Craig V., to Hamlin, Inc. Multiple reed switch module. 4,547,756, Cl. 335-152.000.
Miller, Richard F., to Atlantic Richfield Company. Hydrocarbon oils with improved pour points. 4,547,202, Cl. 44-62.000.
Miller, Robert E., to Union Oil Company of California. Hydrotreating process wherein sulfur is added to the feedstock to maintain the catalyst in sulfided form. 4,547,285, Cl. 208-89.000.
Millett, James A.: *See*—
Millett, Robert A.; and Millett, James A., 4,546,949, Cl. 248-514.000.
Millett, Robert A.; and Millett, James A., to ROI Development Corp. Mount. 4,546,949, Cl. 248-514.000.
Millington, Douglas; and Yewman, Peter W. W., to Cogadill Tool Products, Inc. Reamer with angled blade and full length clamp. 4,547,102, Cl. 408-185.000.
Mimura, Yoshiyuki: *See*—
Toda, Akitoshi; and Mimura, Yoshiyuki, 4,546,722, Cl. 118-657.000.
Minami, Eiji. Musical performance unit. 4,546,687, Cl. 84-1.280.
Minami, Hisashi: *See*—
Tamai, Kenzo; Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Tsuda, Hisatsugu; Sakai, Hiroshi; Sugita, Masatoshi; Yamamoto, Yoshiko; Minami, Hisashi; and Hori, Takako, 4,547,462, Cl. 435-72.000.
Minck, Klaus-Otto: *See*—
Hausberg, Hans-Heinrich; Bottcher, Henning; Gottschlich, Rudolf; Seyfried, Christoph; and Minck, Klaus-Otto, 4,547,576, Cl. 546-197.000.
Minnesota Mining and Manufacturing Company: *See*—
Bell, Vivien L.; Ferguson, Ian J.; and Weatherley, Mark J., 4,547,444, Cl. 430-11.000.
Krueger, Dennis L.; and Meyer, Daniel E., 4,547,420, Cl. 428-229.000.
Minolta Camera Kabushiki Kaisha: *See*—
Ueda, Hideaki, 4,547,447, Cl. 430-78.000.
Mirkovich, Ninko T.: *See*—
Warenback, Douglas H.; Rathmann, Thomas M.; and Mirkovich, Ninko T., 4,547,247, Cl. 156-345.000.
Misumi, Kozo: *See*—
Kadomatsu, Seiji; and Misumi, Kozo, 4,547,554, Cl. 525-334.100.
Misumi, Teruo: *See*—
Shirai, Shigeru; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Misumi, Teruo, 4,547,448, Cl. 430-84.000.
Mita, Kikuo; Oyama, Masayuki; Yoshida, Takashi; Nakashima, Masato; Fujihara, Katsumi; and Nakakuki, Tadao, to Fujitsu Limited. Pattern inspection system. 4,547,895, Cl. 382-8.000.
Mitani, Nobuhiro; and Furusawa, Toshihiro, to Sanyo Electric Co., Ltd. CCD Imager. 4,547,807, Cl. 358-213.000.
Mitchell, Thomas A.: *See*—
Dombroski, John R.; Hawkins, J. Maynard; Pollock, Mark A.; Leonard, Alan P.; and Mitchell, Thomas A., 4,547,329, Cl. 264-118.000.
Miter, Inc.: *See*—
Driskell, Thomas D., 4,547,157, Cl. 433-173.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Hine, Shiro, 4,547,231, Cl. 148-175.000.
Maruyama, Masahiko, 4,547,651, Cl. 219-121.0LG.
Suzuki, Hiroyoshi; and Washino, Shoichi, 4,547,147, Cl. 431-265.000.
Yamauchi, Shiro, 4,547,316, Cl. 252-571.000.
Mitsubishi Gas Chemical Company, Inc.: *See*—
Osugi, Minoru; Nakamura, Tadasi; and Ebata, Shuji, 4,547,482, Cl. 502-208.000.
Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
Tanase, Teruyoshi; Nishigaki, Kenichi; and Ajima, Tatsuro, 4,547,470, Cl. 501-87.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Yamamoto, Takashi; and Sakunaga, Kenichi, 4,547,040, Cl. 350-96.340.
Mitsui Petrochemical Industries, Ltd.: *See*—
Toyota, Akinori; and Kashiwa, Norio, 4,547,552, Cl. 525-247.000.
Yamanaka, Toru; and Yoshimura, Tadatoshi, 4,547,585, Cl. 560-075.000.
Miyadera, Hiroshi: *See*—
Uchida, Kenji; Sakamoto, Masakatsu; Saito, Makoto; Kamino, Yukishige; and Miyadera, Hiroshi, 4,547,132, Cl. 417-63.000.
Miyagi, Ken: *See*—
Tamura, Yasuyuki; Nakaoka, Masaki; Miyagi, Ken; Nogashima, Nao; Sue, Yasuhiko; Suda, Masashi; and Ariga, Masao, 4,547,628, Cl. 178-2.00B.
Miyasaka, Kingo: *See*—
Sumiyoshi, Kikuo; Sato, Eiji; Kojima, Masamitsu; Izumi, Masayoshi; and Miyasaka, Kingo, 4,547,434, Cl. 428-609.000.
Miyata, Shigeo; and Iizima, Noriko, to Kyowa Chemical Industry Co. Ltd. Process for removing a halogen component derived from a catalyst from an organic compound containing said halogen component. 4,547,620, Cl. 585-852.000.
Miyauchi, Kazuo: *See*—
Mae, Hisao; and Miyauchi, Kazuo, 4,546,732, Cl. 123-1.00A.
Miyazaki, Noriyuki: *See*—
Fukuda, Masahiro; Okabayashi, Akitoshi; Narahara, Tadashi; Muramatsu, Kenji; Miyazaki, Noriyuki; and Fukushima, Masanori, 4,546,527, Cl. 29-132.000.

Miyoshi, Katsuyoshi: *See—*
Terano, Minoru; Soga, Hirokazu; Inoue, Masuo; and Miyoshi, Katsuyoshi, 4,547,476, Cl. 502-127.000.

Mizuno, Shigeo; Kubota, Kazuhisa; and Ichikawa, Takahumi, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Slidable contact assembly. 4,547,636, Cl. 200-61.540.

Mizuno, Shigeo: *See—*
Kanada, Shigeyasu; Mizuno, Shigeo; Nakano, Yoshio; and Nishimura, Yuji, 4,546,933, Cl. 242-107.000.

Moberg, Kurt E. L., to Karl Ove Nyberg. Compressed air coupling. 4,546,956, Cl. 251-149.600.

Mobil Oil Corporation: *See—*
Avidan, Amos A.; Gould, Ronald M.; and Kane, Steven E., 4,547,616, Cl. 585-640.000.
Bowes, Emmerson, 4,547,485, Cl. 502-314.000.
Braid, Milton, deceased, 4,547,302, Cl. 252-48.400.
Clayton, William J., 4,546,515, Cl. 15-209.00C.
Cook, John E.; Hagerty, Robert O.; and Jacob, Frederick W., 4,547,555, Cl. 526-60.000.
Dessau, Ralph M., 4,547,609, Cl. 585-517.000.
Forbus, Nancy P., 4,547,618, Cl. 585-660.000.
Garwood, William E.; and Schoennagel, Hans J., 4,547,613, Cl. 585-533.000.
Holland, Robert E.; and Tabak, Samuel A., 4,547,601, Cl. 585-310.000.
Kresge, Charles T.; McWilliams, John P.; Vartuli, James C.; and Nicoletti, Michael P., 4,547,605, Cl. 585-467.000.
Langrock, Donald G., 4,546,721, Cl. 114-230.000.
Tabak, Samuel A., 4,547,602, Cl. 585-314.000.
Tabak, Samuel A., 4,547,612, Cl. 585-533.000.

Mochizuki, Akihiro; Ikegami, Kasumi; Narusawa, Toshiaki; and Okuyama, Hirofumi, to Fujitsu Limited. Storage-type liquid crystal composition. 4,547,309, Cl. 252-299.630.

Mockli, Peter, to Ciba-Geigy Corporation. Substituted benzopyran compounds. 4,547,579, Cl. 549-280.000.

Modern Globe, Inc.: *See—*
Yow, Larry R., 4,547,255, Cl. 156-580.000.

Modesitt, Phillip C.: *See—*
McLaughlin, Wayne C.; Recker, William J.; Modesitt, Phillip C.; and Francescon, Paul K., 4,546,830, Cl. 166-370.000.

Mohaupt, John M., to Delkor Industries, Inc. Machine and method for loading cartons with irregularly shaped individual articles. 4,546,594, Cl. 53-447.000.

Moll, Manfred; Bazard, Daniel; Niclause, Michel; Vincent, Louis-Marie; and Andre, Jean-Claude, to Centre de Recherche et de Development. Apparatus and process for measuring the colloidal stability of liquids. 4,547,070, Cl. 356-339.000.

Moller, Erwin; and Iyimen, Siddik, to Iyimen, Siddik. Method for corning meat. 4,547,379, Cl. 426-281.000.

Momma, Yoshinobu: *See—*
Kawabe, Yunosuke; and Momma, Yoshinobu, 4,546,537, Cl. 29-576.00W.

Monsanto Company: *See—*
Bekker, Vladimir; Buchheim, Wayne J.; Vanderlinde, William; and Wang, Donald S. T., 4,547,428, Cl. 428-402.000.
Li, Tao P., 4,547,484, Cl. 502-249.000.
Shen, Chung Y., 4,547,589, Cl. 562-572.000.
Vavere, Atis, 4,547,614, Cl. 585-606.000.

Montle, Robert E., to Sackner Products, Inc. Upholstery welt cord. 4,547,426, Cl. 428-377.000.

Moore, Alan; Harman, Geoffrey E.; Rosser, David G.; and Clapham, Edward F., to Rolls-Royce Limited. Nose bullet anti-icing for gas turbine engines. 4,546,604, Cl. 60-39.093.

Moore, Paul C., Jr., to Long, John A., a part interest. Insulin syringe injector apparatus with auto-aspirator feature. 4,547,189, Cl. 604-136.000.

Moorehead, Harvey R. Hub assemblies and extensions for indwelling catheter tubes and method. 4,547,194, Cl. 604-283.000.

Moose Products, Inc.: *See—*
Steele, David C., 4,547,767, Cl. 340-500.000.

Morana, Frank J. Sheet music holder. 4,546,689, Cl. 84-505.000.

Moray Industries Limited: *See—*
Dickenson, Alfred J., 4,546,492, Cl. 2-46.000.

Moresi, Joseph A., Jr.: *See—*
Efford, Thomas W.; and Moresi, Joseph A., Jr., 4,547,829, Cl. 361-306.000.

Morgan Construction Company: *See—*
Jalil, Asjed A.; Winslow, Earl S., Jr.; and Gage, Charles H., 4,546,957, Cl. 266-106.000.

Morgan, Thomas E.; and Tengler, John, to A P Products Incorporated. Low profile test clip. 4,547,028, Cl. 339-14.00R.

Mori, Masafumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for scanning a plane with light beams. 4,547,038, Cl. 350-6.500.

Mori, Mikio. Overcasting attachment for a sewing machine. 4,546,715, Cl. 112-162.000.

Mori, Yoshihisa; and Takashima, Mitsuru, to Sony Corporation. Moving coil type cartridge mounted on cantilever within central opening of ring magnet. 4,547,874, Cl. 369-139.000.

Morikawa, Hideyuki: *See—*
Sanuki, Sannosuke; and Morikawa, Hideyuki, 4,547,340, Cl. 422-116.000.

Morisawa, Tahei, to Asahi Kogaku Kogyo Kabushiki Kaisha. Mechanism for charging the mirror and shutter in a video still camera. 4,547,052, Cl. 354-152.000.

Morita, Hideo: *See—*
Hattori, Yasuo; Morita, Hideo; and Inoki, Yoshihiro, 4,547,560, Cl. 526-340.000.

Moriya, Kouichi; Iwata, Kouki; and Takefuta, Hideyasu, to Diesel Kiki Co., Ltd. Fuel supply control system. 4,546,736, Cl. 123-179.00G.

Moriyama, Satoru: *See—*
Kaneko, Kimiyoshi; Ishikawa, Hiromichi; Moriyama, Satoru; and Uchiyama, Tsugio, 4,547,524, Cl. 514-594.000.

Morong, William H., to General Electric Company. Light load adjust apparatus for electric meter. 4,547,730, Cl. 324-137.000.

Mortimer, Thomas P.; and Suciu, Gabriel L., to United Technologies Corporation. Heat exchange system. 4,546,605, Cl. 60-226.100.

Morton Thiokol, Inc.: *See—*
Adams, Gary V.; Ahlf, Wilbur J.; Cunningham, Donald J.; and Dahle, David P., 4,547,342, Cl. 422-166.000.
Schneiter, Fred E.; and McDonald, Allan J., 4,547,235, Cl. 149-35.000.

Mosch, Theodorus W. System wall or system ceiling. 4,546,587, Cl. 52-489.000.

Motonami, Masanao: *See—*
Suzuki, Ichiro; Motonami, Masanao; Yamada, Makoto; and Yoshitsugu, Noritada, 4,546,998, Cl. 280-807.000.

Motooka, Naoki: *See—*
Kazuoka, Koji; Suganuma, Testuya; Motooka, Naoki; and Kuroishi, Nobuhito, 4,546,737, Cl. 123-188.00S.

Motorola, Inc.: *See—*
Gurtler, Richard W.; Legge, Ronald N.; and Lesk, Israel A., 4,547,256, Cl. 156-603.000.
Kuo, Clinton C. K., 4,547,749, Cl. 331-57.000.
Li, Edward, 4,547,715, Cl. 318-345.00B.
Ryan, Carl R.; and Hambley, Allan R., 4,547,888, Cl. 375-14.000.

Mouser, Donald D., to Horizon Sports, Inc. Basketball apparatus. 4,546,973, Cl. 273-1.50R.

Mowry, Donald E., to Don Mowry Flexo Parts, Inc. Corrugated box machine. 4,547,183, Cl. 493-182.000.

Mrozik, Helmut H.; and Waksmunski, Frank S., to Merck & Co., Inc. C-8A-Oxo-avermectin and milbemycin derivatives, pharmaceutical compositions and method of use. 4,547,491, Cl. 514-30.000.

Mruk, William J.: *See—*
Bialas, John S., Jr.; Daniels, Richard J.; and Mruk, William J., 4,547,682, Cl. 307-297.000.

Much, Joachim: *See—*
Arenhovel, Clemens; Much, Joachim; Onallah, Ali-Maher; and Schmidt, Volkmar, 4,547,142, Cl. 425-378.00R.

Muench, Wayne C.: *See—*
Louks, David H.; Thompson, Leonard R.; and Muench, Wayne C., 4,547,597, Cl. 568-779.000.

Muetzel, Wolfgang: *See—*
Pfeiffer, Heinrich; Muetzel, Wolfgang; and Speck, Ulrich, 4,547,357, Cl. 424-5.000.

Muggli, Jurg; and Labhart, Martin, to Cerberus AG. Smoke detector operating according to the radiation extinction principle. 4,547,675, Cl. 250-565.000.

Mui, Shou Y., to United States of America, Army. Pseudo-random convolutional interleaving. 4,547,887, Cl. 375-1.000.

Mukohyama, Hideaki; Hiraoka, Ryoichi; Ushijima, Shohachi; and Saito, Motoyasu, to Kohjin Co., Ltd. Process for preparing carboxymethyl ethyl cellulose suitable for enteric coating. 4,547,571, Cl. 536-90.000.

Mukunoki, Yasuo: *See—*
Kamio, Takayoshi; Ohga, Kunihiko; and Mukunoki, Yasuo, 4,547,459, Cl. 430-631.000.

Mulder, Thomas J.: *See—*
De Vita, Joseph P.; Mulder, Thomas J.; O'Mohundro, Kenneth J.; Wellington, Leslie J.; Deeter, Wayne R.; and Sternaman, Larry D., 4,547,880, Cl. 370-91.000.

Muller, Erwin, to Siemens Aktiengesellschaft. Coil form. 4,547,759, Cl. 336-192.000.

Muller, Gerhard: *See—*
Rausch, Werner; and Muller, Gerhard, 4,547,269, Cl. 204-34.000.

Muller, Rolf, to Papst-Motoren GmbH & Co. KG. Low magnetic leakage flux brushless pulse controlled d-c motor. 4,547,714, Cl. 318-254.000.

Muller, Thomas; and Siegemund, Gunter, to Hoechst Aktiengesellschaft. Catalysts for fluorination and/or dismutation reactions on halogenated hydrocarbons, and a process for their preparation. 4,547,483, Cl. 502-226.000.

Murai, Kaoru, to ORC Manufacturing Co., Ltd. Exposure apparatus. 4,547,066, Cl. 355-97.000.

Murakami, Shohachi: *See—*
Tamai, Kenzo; Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Tsuda, Hisatsugu; Sakai, Hiroshi; Sugita, Masatoshi; Yamamoto, Yoshiko; Minami, Hisashi; and Hori, Takako, 4,547,462, Cl. 435-72.000.

Murakami, Yoshikazu; and Yamada, Hiromi, to Sony Corporation. Ferromagnetic resonator. 4,547,754, Cl. 333-219.000.

Muralidhara, Ranya: *See—*
Light, Kenneth K.; Schreiber, William L.; McGhie, Joseph A.; Schreck, Ronald P.; Yoshida, Takao; Schreiber, Loren B.; and Muralidhara, Ranya, 4,547,594, Cl. 568-392.000.

Muramatsu, Hiromochi; Watanabe, Atsushi; and Hara, Kunihiko, to Nippondenso Co., Ltd. Electrochromic display device. 4,547,046, Cl. 350-357.000.

Muramatsu, Kenji: *See*—
Fukuda, Masahiro; Okabayashi, Akitoshi; Narahara, Tadashi; Muramatsu, Kenji; Miyazaki, Noriyuki; and Fukushima, Masanori, 4,546,527, Cl. 29-132.000.

Muramatsu, Shigeki: *See*—
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Murata Manufacturing Co., Ltd.: *See*—
Kasanami, Tohru; Tani, Hirozi; and Yokoi, Tsutomu, 4,547,310, Cl. 252-511.000.

Murayama, Kosho, to Dai Nippon Insatsu Kabushiki Kaisha. Apparatus for affixing labels to moving web. 4,547,250, Cl. 156-384.000.

Murray Industries: *See*—
Little, David H., 4,547,288, Cl. 210-232.000.

Musschoot, Albert, to General Kinematics Corporation. Discharge control structure for vibratory apparatus. 4,546,872, Cl. 198-525.000.

Musser, John H.; and Sutherland, Charles A., to USV Pharmaceutical Corp. 5,6,7-Quinoline carbanilates and method of treating ischemic heart disease therewith. 4,547,509, Cl. 514-311.000.

Mussler, Klaus: *See*—
Kiesewetter, Holger; Myrenne, Heinz; Lazar, Hartmut; and Mussler, Klaus, 4,547,735, Cl. 324-450.000.

Myers, Daryl L.: *See*—
Bair, Wallace C.; Myers, Daryl L.; and Rogers, Jane W., 4,547,644, Cl. 219-10.49R.

Myers, Ronald L. Safe lock anti-theft hydraulic brake control system. 4,546,846, Cl. 180-287.000.

Mylan Pharmaceuticals Inc.: *See*—
Blume, Cheryl D.; and Bonner, Paul H., 4,547,498, Cl. 514-225.000.

Mylander, Richard H., to J. I. Case Company. Transmission control assembly. 4,546,664, Cl. 74-473.00R.

Myrenne, Heinz: *See*—
Kiesewetter, Holger; Myrenne, Heinz; Lazar, Hartmut; and Mussler, Klaus, 4,547,735, Cl. 324-450.000.

Naarmann, Herbert, to BASF Aktiengesellschaft. Electrochemical polymerization of pyrroles, an anode for carrying this out, and products obtained by this procedure. 4,547,270, Cl. 204-58.500.

Nabors, Lester G., to Phillips Petroleum Company. Polyester blends containing a metal oxide desiccant. 4,547,536, Cl. 523-514.000.

Naccarato, Peter D.; and Johnson, Robert W., to Valeron Corporation, The. Adjustable milling cutter. 4,547,100, Cl. 407-39.000.

Nado-Gogo Sake Brewers Common Facility Corporation: *See*—
Takeuchi, Itsuo; Yokoshima, Teruaki; Tabata, Noboru; Fujita, Eishin; Nagata, Koshiro; and Kishimoto, Tetsuya, 4,547,372, Cl. 426-11.000.

Nagahashi, Kenji: *See*—
Ohtombe, Ko; Ishida, Tsuyoshi; Osawa, Hideo; and Nagahashi, Kenji, 4,547,896, Cl. 382-7.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Bicycle brake having an improved adjustment mechanism for adjusting the position of a brake shoe relative to a wheel rim. 4,546,858, Cl. 188-24.190.

Nagao, Masatoshi, to Sumitomo Gomu Kogyo Kabushiki Kaisha. Fender beam and life ladder in one. 4,546,856, Cl. 182-228.000.

Nagasaka, Syuichi; and Kaneko, Siyoukichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for reacting a semiconductor wafer with steam. 4,546,726, Cl. 118-719.000.

Nagasaki, Nobuo: *See*—
Arakawa, Tadao; Noguchi, Yoshiki; Hishinuma, Yukio; and Nagasaki, Nobuo, 4,546,603, Cl. 60-39.120.

Nagashima, Akihiro: *See*—
Nakatomi, Yasuo; Saito, Hiraku; Nagashima, Akihiro; and Umeda, Fumio, 4,547,374, Cl. 426-19.000.

Nagasu, Akira: *See*—
Tobita, Tomoyuki; Yamamoto, Yoshimi; Nagasu, Akira; and Takahashi, Yukio, 4,546,653, Cl. 73-720.000.

Nagata, Koshiro: *See*—
Takeuchi, Itsuo; Yokoshima, Teruaki; Tabata, Noboru; Fujita, Eishin; Nagata, Koshiro; and Kishimoto, Tetsuya, 4,547,372, Cl. 426-11.000.

Nagayama, Haruhiko; and Tomita, Satoru, to Ricoh Company, Ltd. Image-transfer-type electrostatic recording apparatus. 4,547,059, Cl. 355-3.0BE.

Nagumo, Fumio: *See*—
Iwase, Seiichiro; Asaida, Takashi; and Nagumo, Fumio, 4,547,796, Cl. 358-13.000.

Nakada, Yasuo: *See*—
Ide, Junya; Muramatsu, Shigeki; Nakada, Yasuo; and Kitano, Noritoshi, 4,547,520, Cl. 514-450.000.

Nakagawa, Seiichi; and Norioka, Setsuo, to Jeol Ltd. Electron beam scanning device. 4,547,669, Cl. 250-310.000.

Nakajima, Nobuyuki; and Yamada, Keiichi, to Diesel Kiki Co., Ltd. Fuel injection valve with variable discharge area of nozzle holes. 4,546,739, Cl. 123-299.000.

Nakajima, Sadahiro; Kanamori, Chiemi; and Toratani, Hisayoshi, to Hoya Corporation. Method of increasing the thermal shock resistance of phosphate laser glass. 4,547,402, Cl. 427-169.000.

Nakakuki, Tadao: *See*—
Mita, Kikuo; Oyama, Masayuki; Yoshida, Takashi; Nakashima, Masato; Fujihara, Katsumi; and Nakakuki, Tadao, 4,547,895, Cl. 382-8.000.

Nakama, Daiji, to Nifco Inc. Trim cover clip. 4,547,108, Cl. 411-374.000.

Nakamura, Fumiaki: *See*—
Kubo, Sanae; and Nakamura, Fumiaki, 4,547,365, Cl. 424-71.000.

Nakamura, Mamoru; and Shibata, Fumio, to Nippon Zeon Co. Ltd. Process for producing powdery composite polymer. 4,547,549, Cl. 525-197.000.

Nakamura, Michiharu: *See*—
Ueyanagi, Kiichi; Umemoto, Yasunari; Takahashi, Susumu; and Nakamura, Michiharu, 4,546,540, Cl. 29-579.000.

Nakamura, Mutsuaki: *See*—
Hamaguchi, Toshiaki; Namikawa, Kazuhira; Goshima, Toshikazu; Nakamura, Mutsuaki; Kuroda, Akio; and Kudo, Yoshiaki, 4,547,545, Cl. 524-269.000.

Nakamura, Tadasi: *See*—
Osugi, Minoru; Nakamura, Tadasi; and Ebata, Shuji, 4,547,482, Cl. 502-208.000.

Nakamura, Tatsushi: *See*—
Ohta, Takeo; Nakamura, Tatsushi; and Akahira, Nobuo, 4,547,875, Cl. 369-275.000.

Nakanishi, Haruo: *See*—
Ohashi, Azusa; Sakaki, Hirokazu; Nakanishi, Haruo; Tanabe, Zenichi; Tsuchida, Shin; and Hayashi, Yoshikatsu, 4,547,274, Cl. 204-129.400.

Nakaniwa, Mikio: *See*—
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Nakano, Yoshio: *See*—
Kanada, Shigeyasu; Mizuno, Shigeo; Nakano, Yoshio; and Nishimura, Yuji, 4,546,933, Cl. 242-107.000.

Nakaoka, Masaki: *See*—
Tamura, Yasuyuki; Nakaoka, Masaki; Miyagi, Ken; Nogashima, Nao; Sue, Yasuhiko; Suda, Masashi; and Ariga, Masao, 4,547,628, Cl. 178-2.00B.

Nakashima, Masato: *See*—
Mita, Kikuo; Oyama, Masayuki; Yoshida, Takashi; Nakashima, Masato; Fujihara, Katsumi; and Nakakuki, Tadao, 4,547,895, Cl. 382-8.000.

Nakata, Yukio; and Shiotsu, Osamu, to Hitachi, Ltd.; and Yagi Antenna Co., Ltd. System for frequency modulation. 4,547,751, Cl. 332-16.00R.

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Nakazawa, Shigeo: *See*—
Arita, Masashi; and Nakazawa, Shigeo, 4,546,635, Cl. 72-345.000.

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Yeoman, Alan M., 4,547,540, Cl. 524-130.000.

Nally, Robert B.; Akister, James F.; and Ma, Hung S., to NCR Corporation. Waveform matching system and method. 4,547,899, Cl. 382-7.000.

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Hamaguchi, Toshiaki; Namikawa, Kazuhira; Goshima, Toshikazu; Nakamura, Mutsuaki; Kuroda, Akio; and Kudo, Yoshiaki, 4,547,545, Cl. 524-269.000.

Nanba, Isao: *See*—
Arichi, Isao; Koh, Takuji; and Nanba, Isao, 4,547,077, Cl. 368-107.000.

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Narahara, Tadashi: *See*—
Fukuda, Masahiro; Okabayashi, Akitoshi; Narahara, Tadashi; Muramatsu, Kenji; Miyazaki, Noriyuki; and Fukushima, Masanori, 4,546,527, Cl. 29-132.000.

Narusawa, Toshiaki: *See*—
Mochizuki, Akihiro; Ikegami, Kasumi; Narusawa, Toshiaki; and Okuyama, Hirofumi, 4,547,309, Cl. 252-299.630.

Naruse, Tsunehide, to Victor Company of Japan, Ltd. Magnetic recording media. 4,547,425, Cl. 428-328.000.

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Sugimoto, Hiroshi; and Naruse, Yujiro, 4,547,670, Cl. 250-370.000.

Natarelli, Gerard E.: *See*—
Steltenkamp, Robert J.; Douglass, Miriam L.; and Natarelli, Gerard E., 4,547,361, Cl. 424-49.000.

Natesh, Ram: *See*—
Virkar, Anil V.; and Natesh, Ram, 4,546,652, Cl. 73-776.000.

National Can Corporation: *See*—
Snyder, Walter W.; and Dettmer, Dennis G., 4,546,636, Cl. 72-346.000.

National Computer Systems, Inc.: *See*—
Heal, David, 4,547,666, Cl. 250-227.000.

National Mine Service Company: *See*—
Kelley, Barry R.; LeBegue, Maurice K.; and Michael, Earl C., 4,546,849, Cl. 180-326.000.

National Research Development Corporation: *See*—
Clark, Michael G., 4,547,773, Cl. 340-765.000.
Isherwood, David P.; and Younan, Hany R., 4,546,654, Cl. 73-844.000.
Jenkins, Walter N., 4,547,391, Cl. 427-37.000.

NCR Corporation: *See*—
Marinelli, Nicola, 4,547,222, Cl. 106-21.000.
Nally, Robert B.; Akister, James F.; and Ma, Hung S., 4,547,899, Cl. 382-7.000.

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Nebergall, Perry A.; and French, Robert C. Method for dielectrically joining tubular members. 4,547,641, Cl. 219-10.410.
NEC Corporation: *See*—
Matsumoto, Michio; and Kitagawa, Kunio, 4,547,086, Cl. 400-124.000.
Nederlandse Centrale Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek: *See*—
Bulten, Eric J.; and Budding, Hendrik A., 4,547,320, Cl. 556-83.000.
Neel, Emmanuel E. A.; Levavasseur, Jacques A.; and Lucien, Jacques P., to Shell Oil Company. Process for the hydroisomerization of petroleum waxes. 4,547,283, Cl. 208-46.000.
Negishi, Tohru. Spectacle frame for multifocal lenses. 4,547,048, Cl. 351-137.000.
Nemeth, Janos: *See*—
Martinko, Matyas; Elekes, Andras; Simon, Kalman; Bohnert, Jozef; Nemeth, Janos; Bole, Karoly; and Ilyes, Zoltan, 4,547,098, Cl. 405-291.000.
Neomed, Inc.: *See*—
Ecanow, Charles S.; and Ecanow, Bernard, 4,547,490, Cl. 514-21.000.
Neptune Microfloc, Inc.: *See*—
Hsiung, Andrew K., 4,547,286, Cl. 210-738.000.
Nesmith, Malcolm F., to United States of America, National Aeronautics and Space Administration. Self-locking telescoping manipulator arm. 4,547,121, Cl. 414-753.000.
Nessfield, Stanley, to Sea Co Services Limited. Freight-carrying platforms. 4,546,945, Cl. 248-346.000.
Nestec S.A.: *See*—
Bengtsson, Bengt L.; and Lindberg, Peter, 4,547,380, Cl. 426-302.000.
Nestler, Hans J., to Hoechst Aktiengesellschaft. Process for esterifying phenol-containing carboxylic acids. 4,547,583, Cl. 560-061.000.
Netzer, David, to Randall Corporation, The. Carbon dioxide hydrocarbons separation process utilizing liquid-liquid extraction. 4,547,209, Cl. 62-17.000.
Neville, Gordon H.: *See*—
McEntire, Edward E.; Neville, Gordon H.; and Nieh, Edward C. Y., 4,547,304, Cl. 252-79.100.
Newelec Pretoria Ltd.: *See*—
Loudon, Stuart D., 4,547,720, Cl. 318-782.000.
Newman, Howard F., to American Hospital Supply Corporation. Adjustable stop for dispensing syringe. 4,546,859, Cl. 188-67.000.
Ngo, Peter D. T., to AT&T Information Systems Inc. Liquid crystal display with electrode shielding another electrode. 4,547,042, Cl. 350-334.000.
Nguyen, Van H., to International Telephone & Telegraph Corp. Densitometer. 4,546,641, Cl. 73-32.00A.
NHK Spring Co., Ltd.: *See*—
Ohno, Akira; Itakura, Yasushi; Tabe, Takayuki; and Hiromoto, Shuji, 4,546,958, Cl. 267-47.000.
Nicholas, Keith H., to U.S. Philips Corporation. Semiconductor device manufacture. 4,546,534, Cl. 29-571.000.
Nichols, Gus. Solventless polymeric composition comprising non arylamine, polyacrylate and epoxide. 4,547,562, Cl. 528-119.000.
Niclause, Michel: *See*—
Moll, Manfred; Bazard, Daniel; Niclause, Michel; Vincent, Louis-Marie; and Andre, Jean-Claude, 4,547,070, Cl. 356-339.000.
Nicolas, Christian: *See*—
Cormary, Yves; and Nicolas, Christian, 4,546,917, Cl. 236-44.00C.
Nicoletti, Michael P.: *See*—
Kresge, Charles T.; McWilliams, John P.; Vartuli, James C.; and Nicoletti, Michael P., 4,547,605, Cl. 585-467.000.
Nicoloff, Demetre M.: *See*—
Possis, Zinon C.; and Nicoloff, Demetre M., 4,546,499, Cl. 623-1.000.
Nicolussi, Franco: *See*—
Macchi, Carla; and Nicolussi, Franco, 4,547,095, Cl. 405-206.000.
Nieh, Edward C. Y.: *See*—
McEntire, Edward E.; Neville, Gordon H.; and Nieh, Edward C. Y., 4,547,304, Cl. 252-79.100.
Niemi, Jouko. Pressure-chamber grinder. 4,546,926, Cl. 241-39.000.
Nieuwendijk, Joris A. M.; Sanders, Georgius B. J.; van Dijk, Cornelis D.; and Kaizer, Adrianus J. M., to U.S. Philips Corporation. Large-excursion electroacoustic transducer. 4,547,631, Cl. 179-115.50R.
Nifco Inc.: *See*—
Nakama, Daiji, 4,547,108, Cl. 411-374.000.
Nihon Cement Co., Ltd.: *See*—
Goto, Takaharu; Sato, Takeshi; Sakai, Kouzou; and Ii, Motohiko, 4,547,223, Cl. 106-90.000.
Nihon Plast Company, Limited: *See*—
Ouchi, Toshiki; and Sano, Yoshiaki, 4,546,695, Cl. 98-121.200.
Nilsson, Kurt A. I., to Telefonaktiebolaget LM Ericsson. Monitoring device for integrated drive amplifiers. 4,547,740, Cl. 330-2.000.
Nilsson, Robert T.: *See*—
Houle, Raymond T.; Kilbourn, Frederick A.; De Kraker, James E.; and Nilsson, Robert T., 4,546,506, Cl. 4-555.000.
Nims, Dean L. Method of increasing basketball shooting accuracy and awareness. 4,546,975, Cl. 273-65.00R.
Nippon Oil Company, Ltd.: *See*—
Sakata, Co; and Imai, Hirosuke, 4,547,463, Cl. 435-180.000.
Takeda, Hirro, 4,547,151, Cl. 432-14.000.
Nippon Oil and Fats Company Limited: *See*—
Takeuchi, Fumio; Takahashi, Masao; and Sakai, Hiroshi, 4,547,234, Cl. 149-3.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Tanaka, Katsuhiko; and Sakatani, Ikunori, 4,547,081, Cl. 384-107.000.
Nippon Soken, Inc.: *See*—
Igashira, Toshihiko; Sakakibara, Yasuyuki; Abe, Seiko; Koide, Hiroshi; and Shinoda, Kazuo, 4,546,749, Cl. 123-506.000.
Nishimura, Yuji; Fujiwara, Akinori; Kawaguchi, Teruhiko; Shimogawa, Toshiaki; and Sakakibara, Kazuo, 4,546,934, Cl. 242-107.000.
Teratani, Tatsuo; and Kodera, Masao, 4,547,731, Cl. 324-58.00R.
Nippon Steel Corporation: *See*—
Fukuda, Masahiro; Okabayashi, Akitoshi; Narahara, Tadashi; Muramatsu, Kenji; Miyazaki, Noriyuki; and Fukushima, Masanori, 4,546,527, Cl. 29-132.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Ochi, Hiroshi; and Tetsutani, Nobuji, 4,547,811, Cl. 358-280.000.
Nippon Zeon Co. Ltd.: *See*—
Nakamura, Mamoru; and Shibata, Fumio, 4,547,549, Cl. 525-197.000.
Yamamoto, Haruhisa, 4,547,615, Cl. 585-621.000.
Nippondenso Co., Ltd.: *See*—
Fukami, Yasuhiko; Sawada, Toshiichi; and Kinkori, Shuzo, 4,546,733, Cl. 123-52.0MB.
Kobayashi, Akio; Harada, Susumu; Harada, Takashi; Kikuchi, Takehiro; and Honda, Masakazu, 4,546,747, Cl. 123-489.000.
Muramatsu, Hiromochi; Watanabe, Atsushi; and Hara, Kunihiko, 4,547,046, Cl. 350-357.000.
Nishizawa, Kazutoshi; Takagi, Masashi; and Nishi, Yasuyuki, 4,547,133, Cl. 417-270.000.
Tamura, Masami, 4,546,822, Cl. 165-149.000.
Nishi, Yasuyuki: *See*—
Nishizawa, Kazutoshi; Takagi, Masashi; and Nishi, Yasuyuki, 4,547,133, Cl. 417-270.000.
Nishida, Hidehiko; Koshino, Minoru; Tateishi, Terutaka; and Hattori, Akira, to Fujitsu Limited. Access control processing system in computer system. 4,547,848, Cl. 364-200.000.
Nishigaki, Kenichi: *See*—
Tanase, Teruyoshi; Nishigaki, Kenichi; and Ajima, Tatsuro, 4,547,470, Cl. 501-87.000.
Nishikawa, Akira: *See*—
Hamada, Takaaki; Kobayakawa, Yohji; Nishikawa, Akira; and Kawahara, Manabu, 4,546,857, Cl. 186-37.000.
Nishimatsu, Masaharu; Ide, Toshiaki; Arioka, Hiroyuki; and Kubota, Yuichi, to TDK Corporation. Magnetic recording medium. 4,547,419, Cl. 428-212.000.
Nishimoto, Yoshiharu: *See*—
Ohya, Masaki; Nishimoto, Yoshiharu; and Yamazaki, Kengo, 4,547,433, Cl. 428-516.000.
Nishimura, Yoshio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Tanaka, Wataru; Takita, Tomohisa; Nishimura, Yoshio; and Yoshikawa, Hiroshi, 4,547,567, Cl. 536-17.200.
Nishimura, Yuji; Fujiwara, Akinori; Kawaguchi, Teruhiko; Shimogawa, Toshiaki; and Sakakibara, Kazuo, to Kabushiki Kaisha Tokai Rika Denki Seisakusho; and Nippon Soken, Inc. Webbing tension device. 4,546,934, Cl. 242-107.000.
Nishimura, Yuji: *See*—
Kanada, Shigeyasu; Mizuno, Shigeo; Nakano, Yoshio; and Nishimura, Yuji, 4,546,933, Cl. 242-107.000.
Nishio, Ken-ichi: *See*—
Yamatsuta, Kohji; and Nishio, Ken-ichi, 4,547,435, Cl. 428-614.000.
Nishiwaki, Yoshikazu: *See*—
Yoshida, Kenichi; Yokohara, Takashi; Ono, Kimizo; Nishiwaki, Yoshikazu; and Tsuno, Koichi, 4,547,072, Cl. 356-350.000.
Nishizawa, Kazutoshi; Takagi, Masashi; and Nishi, Yasuyuki, to Nippondenso Co., Ltd. Variable capacity compressor. 4,547,133, Cl. 417-270.000.
Nissan Motor Co., Ltd.: *See*—
Hayashi, Yoshimasa, 4,547,180, Cl. 474-159.000.
Iijima, Yoshitaka; Uno, Takaaki; and Watanabe, Mitsuru, 4,546,848, Cl. 180-312.000.
Kurata, Hidenori; Inaba, Kazuo; Sugiyama, Tomokazu; and Hirata, Tomio, 4,547,655, Cl. 219-204.000.
Noguchi, Hiroshi, 4,546,839, Cl. 180-142.000.
Ouchi, Toshiki; and Sano, Yoshiaki, 4,546,695, Cl. 98-121.200.
Nisus Video Incorporated: *See*—
Swinehart, Steven L., 4,547,051, Cl. 352-216.000.
Nitta, Tsuneharu: *See*—
Fujita, Yosuke; Tohda, Takao; Matsuoka, Tomizo; Abe, Atsushi; and Nitta, Tsuneharu, 4,547,703, Cl. 313-509.000.
Noda, Noriyuki: *See*—
Shimizu, Motoharu; Noda, Noriyuki; and Noguchi, Yoshihiro, 4,547,758, Cl. 335-302.000.
Noel, Alois; Zeitvogel, Josef; Wunderlich, Erhard; and Meichsner, Michael, to ALLWEILER AG Aktiengesellschaft. Motor-pump unit. 4,547,135, Cl. 417-360.000.
Nogashima, Nao: *See*—
Tamura, Yasuyuki; Nakaoka, Masaki; Miyagi, Ken; Nogashima, Nao; Sue, Yasuhiko; Suda, Masashi; and Ariga, Masao, 4,547,628, Cl. 178-2.00B.
Noguchi, Hiroshi, to Nissan Motor Co., Ltd. Rack and pinion steering gear mounting system. 4,546,839, Cl. 180-142.000.
Noguchi, Yoshihiro: *See*—
Shimizu, Motoharu; Noda, Noriyuki; and Noguchi, Yoshihiro, 4,547,758, Cl. 335-302.000.

Noguchi, Yoshiki: *See*—
Arakawa, Tadao; Noguchi, Yoshiki; Hishinuma, Yukio; and Nagasaki, Nobuo, 4,546,603, Cl. 60-39.120.

Nordson Corporation: *See*—
Sticher, Charles K., Jr.; and Hartley, Michael D., 4,547,657, Cl. 219-492.000.
Turner, Herman E., Jr.; and Shanaberger, Jan L., 4,547,120, Cl. 414-744.00R.

Norigoe, Takashi: *See*—
Ochiai, Kuniaki; Norigoe, Takashi; and Iinuma, Masayuki, 4,547,085, Cl. 400-124.000.

Norioka, Setsuo: *See*—
Nakagawa, Seiichi; and Norioka, Setsuo, 4,547,669, Cl. 250-310.000.

Norman, Telfer E. Abrasion-resistant refrigeration-hardenable ferrous alloy. 4,547,221, Cl. 75-128.00C.

Norrell, William L. Dry cleaning machine. 4,546,625, Cl. 68-18.00F.

North American Philips Consumer Electronics Corp.: *See*—
Burdick, Glen A.; Collins, Floyd K.; and Kuryla, Alan T., 4,547,697, Cl. 313-412.000.

North American Philips Corporation: *See*—
Fitzpatrick, Brian J., 4,547,699, Cl. 313-478.000.

North, John M.: *See*—
Hooper, Alan; and North, John M., 4,547,440, Cl. 429-112.000.

North, Walter P. T.: *See*—
Pryor, Timothy R.; Hageniers, Omer L.; and North, Walter P. T., 4,547,674, Cl. 250-560.000.

Northrop Corporation: *See*—
Cohn, David B.; and Komine, Hiroshi, 4,547,883, Cl. 372-25.000.

Novak, Lucille H., to Exxon Production Research Co. Drilling mud composition which may be converted to cement upon irradiation. 4,547,298, Cl. 252-8.50C.

Novoflex Fotogeratebau Karl Muller, Firma: *See*—
Tobler, Werner, 4,547,053, Cl. 354-187.000.

Nuovo Pignone S.p.A.: *See*—
Vinciguerra, Costantino; and Lephilibert, Jean, 4,546,953, Cl. 251-58.000.

Nussbaum, Otto J., to Halstead Industries, Inc. Multiple source energy recovery system. 4,546,818, Cl. 165-47.000.

Nystrom Nordpatent Aktiebolag: *See*—
Mattsson, Lars B. E., 4,546,668, Cl. 74-531.000.

Oace, Jon R., to Research Industries, Inc. Fluid propelling and filtering apparatus with removable filter cartridge. 4,547,208, Cl. 55-400.000.

Oberlander, Andreas: *See*—
Feldman, Joachim; and Oberlander, Andreas, 4,546,860, Cl. 188-71.400.

O'Brien, Edward R., III: *See*—
Kremer, Frederic B.; and O'Brien, Edward R., III, 4,546,773, Cl. 128-660.000.

Oce-Nederland B.V.: *See*—
Dinnissen, Johannes H. A., 4,546,963, Cl. 271-35.000.
Linthout, Theodoor H., 4,546,964, Cl. 271-250.000.

Ochi, Hiroshi; and Tetsutani, Nobuji, to Nippon Telegraph & Telephone Public Corporation. Method and apparatus for gray level signal processing. 4,547,811, Cl. 358-280.000.

Ochiai, Kuniaki; Norigoe, Takashi; and Iinuma, Masayuki, to Tokyo Electric Co., Ltd. Dot printer head. 4,547,085, Cl. 400-124.000.

O'Connor, Robert E., to Amtrol Inc. Double wall heat exchanger. 4,546,819, Cl. 165-70.000.

Oepen, Gerhard; Engel, Jurgen; Jakovlev, Vladimir; and Thiemer, Klaus, to Degussa Aktiengeseilschaft. N-Phenyl-N-'-cycloalkylalkanoylpiperazine useful as analgetics and process for its production. 4,547,505, Cl. 514-255.000.

Oetiker, Hans; and Kummer, Emanuel, to Gebruder Buhler AG. Method and apparatus for the continuous determination of moisture pourable food. 4,547,725, Cl. 324-61.00R.

Ogasawara, Terumi: *See*—
Arai, Masayuki; Ogasawara, Terumi; and Shikano, Tohru, 4,547,808, Cl. 358-228.000.

Ogawa, Hiroe; and Imamura, Yoshisuke, to Takeda Chemical Industries, Ltd. Stabilized solid compositions. 4,547,377, Cl. 426-268.000.

Ogawa, Kyosuke: *See*—
Shirai, Shigeru; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Misumi, Teruo, 4,547,448, Cl. 430-84.000.

Ogren, Dennis F.: *See*—
Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Ogren, Dennis F.; Nakaniwa, Mikio; and Furukawa, Kenji, 4,547,284, Cl. 208-50.000.

O'Hagan, Michael: *See*—
Hinkle, Robert W.; and O'Hagan, Michael, 4,547,778, Cl. 343-456.000.

Ohashi, Azusa; Sakaki, Hirokazu; Nakanishi, Haruo; Tanabe, Zenichi; Tsuchida, Shin; and Hayashi, Yoshikatsu, to Fuji Photo Film Co., Ltd.; and Sumitomo Light Metal Industries Ltd. Support for lithographic printing plate and lithographic printing plate. 4,547,274, Cl. 204-129.400.

Ohga, Kunihiko: *See*—
Kamio, Takayoshi; Ohga, Kunihiko; and Mukunoki, Yasuo, 4,547,459, Cl. 430-631.000.

Ohhachi, Yoshinori: *See*—
Ichikawa, Toshiji; Ohhachi, Yoshinori; and Kanda, Zensho, 4,547,191, Cl. 604-251.000.

Ohhara, Kenji: *See*—
Ri, Masao; Ohhara, Kenji; Yamamoto, Yoshinori; Takada, Akira; Watanabe, Hisanori; and Osada, Yasuo, 4,547,823, Cl. 360-90.000.

Ohhashi, Yasuo, to Honda Giken Kogyo Kabushiki Kaisha. Timing belt pulley and method of manufacture. 4,547,179, Cl. 474-152.000.

Ohmori, Hatsutaro, to Kabushiki Kaisha Ohmori Seisakusho. Spinning type fishing reel with selectably clicking or non-clicking ratchet mechanism. 4,546,932, Cl. 242-84.21R.

Ohmory, Akio: *See*—
Okano, Yoshihiro; Okamoto, Takehiko; and Ohmory, Akio, 4,547,289, Cl. 210-652.000.

Ohngemach, Jorg: *See*—
Herz, Claus P.; Ohngemach, Jorg; and Stahlecker, Otto, 4,547,394, Cl. 427-54.100.

Ohno, Akira; Itakura, Yasushi; Tabe, Takayuki; and Hiromoto, Shuji, to NHK Spring Co., Ltd. Leaf spring. 4,546,958, Cl. 267-47.000.

Ohshima, Satoshi: *See*—
Oine, Toyonari; Yamada, Yoshihisa; Wagatsuma, Mitsuyoshi; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,547,494, Cl. 514-204.000.

Ohta, Takeo; Nakamura, Tatsushi; and Akahira, Nobuo, to Matsushita Electric Industrial Co., Ltd. Optical recording and retrieving disc. 4,547,875, Cl. 369-275.000.

Ohtombe, Ko; Ishida, Tsuyoshi; Osawa, Hideo; and Nagahashi, Kenji, to Tokyo Shibaura Denki Kabushiki Kaisha. Printed matter identifying apparatus. 4,547,896, Cl. 382-7.000.

Ohtomo, Fumio: *See*—
Sasaki, Tsuneo; Ohtomo, Fumio; Yokokura, Takashi; and Kondo, Fumitomo, 4,547,667, Cl. 250-231.0SE.

Ohya, Masaki; Nishimoto, Yoshiharu; and Yamazaki, Kengo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Heat-shrinkable laminate film. 4,547,433, Cl. 428-516.000.

Oiji, Yoshimasa: *See*—
Kumazawa, Toshiaki; Oiji, Yoshimasa; Tanaka, Hiroshi; and Shuto, Katsuichi, 4,547,496, Cl. 514-218.000.

Oiles Industry Co., Ltd.: *See*—
Sumiyoshi, Kikuo; Sato, Eiji; Kojima, Masamitsu; Izumi, Masayoshi; and Miyasaka, Kingo, 4,547,434, Cl. 428-609.000.

Oine, Toyonari; Yamada, Yoshihisa; Wagatsuma, Mitsuyoshi; Yamaguchi, Totaro; and Ohshima, Satoshi, to Tanabe Seiyaku Co., Ltd. Pyrrolidomoxine cephalosporins. 4,547,494, Cl. 514-204.000.

Ojanen, Randall W., to GTE Products Corporation. Rotatable cutting bit. 4,547,020, Cl. 799-86.000.

Ojust, Klaus: *See*—
Kloetzer, Dietrich; Linde, Karl-Heinz; and Ojust, Klaus, 4,547,318, Cl. 260-400.000.

Okabayashi, Akitoshi: *See*—
Fukuda, Masahiro; Okabayashi, Akitoshi; Narahara, Tadashi; Muramatsu, Kenji; Miyazaki, Noriyuki; and Fukushima, Masanori, 4,546,527, Cl. 29-132.000.

Okada, Tokio; Makino, Tsutomu; and Takemura, Michio, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for processing terminal of insulator coated cables. 4,546,675, Cl. 81-9.510.

Okamoto, Takehiko: *See*—
Okano, Yoshihiro; Okamoto, Takehiko; and Ohmory, Akio, 4,547,289, Cl. 210-652.000.

Okamoto, Yoshio; Iwai, Kazumi; Inoue, Hiroshi; Kunugi, Yoshifumi; and Shinozaki, Tadashi, to Hitachi, Ltd. Solenoid valve. 4,546,795, Cl. 137-624.150.

Okamura, Masatoshi; and Ishida, Toshihiko, to TDK Corporation. Magnetic tape cassette casing. 4,546,936, Cl. 242-198.000.

Okano, Yoshihiro; Okamoto, Takehiko; and Ohmory, Akio, to Okano, Yoshihiro; Okamoto, Takehiko; and Ohmory, Akio. Filtration apparatus using hollow fiber membrane. 4,547,289, Cl. 210-652.000.

Oki Electric Industry Co., Ltd.: *See*—
Suzuki, Kenichi, 4,546,538, Cl. 29-576.00W.

Okoshi, Koichi: *See*—
Ono, Kazumasa; and Okoshi, Koichi, 4,546,497, Cl. 2-243.00A.

Okuyama, Hirofumi: *See*—
Mochizuki, Akihiro; Ikegami, Kasumi; Narusawa, Toshiaki; and Okuyama, Hirofumi, 4,547,309, Cl. 252-299.630.

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Arichi, Isao; Koh, Takuji; and Nanba, Isao, 4,547,077, Cl. 368-107.000.
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ORC Manufacturing Co., Ltd.: *See*—
Murai, Kaoru, 4,547,066, Cl. 355-97.000.
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Rajan, Sundar J., to Ethyl Corporation. Methylcyclopentadiene synthesis. 4,547,603, Cl. 585-375.000.
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Netzer, David, 4,547,209, Cl. 62-17.000.
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Shrawder, Carl F.; and Randall, Peter, 4,546,627, Cl. 70-18.000.
Ranken, Paul F., to Ethyl Corporation. Preparation of (hydrocarbylthio)phenols. 4,547,593, Cl. 568-54.000.
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Blossick, Raymond B.; Bortzfield, Frank M.; Brown, Kenneth E.; Herr, Joseph H.; and Rannels, Gerald L., 4,546,574, Cl. 51-170.00T.
Rath, Dale R., to Tektronix, Inc. CRT Shadow mask assembly. 4,547,695, Cl. 313-406.000.
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Leary, David F.; and Brigham, Alan, 4,547,659, Cl. 219-544.000.
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Adams, Walter P., 4,547,844, Cl. 364-189.000.
Raytheon Company: *See*—
Richards, Gerald P., 4,547,803, Cl. 358-140.000.
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Botez, Dan; and Connolly, John C., 4,547,396, Cl. 427-87.000.
Ettenberg, Michael, 4,547,876, Cl. 369-275.000.
Gibson, John J., 4,547,737, Cl. 329-50.000.
Haferl, Peter E., 4,547,708, Cl. 315-371.000.
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Maa, Jer-shen; and Halon, Bernard, 4,547,261, Cl. 156-643.000.
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Southgate, Peter D., 4,547,809, Cl. 358-229.000.
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Childers, John S.; and Pastusek, Paul E., 4,546,837, Cl. 175-340.000.
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Reese, Walter J., to PPG Industries, Inc. Shippable package of glass fiber strands and process for making the package and continuous strand mat. 4,546,880, Cl. 206-410.000.
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Reid, Gilbert M., to Cypress Group Limited, The. Collapsible shipping container. 4,546,896, Cl. 220-4.00F.
Reid, James, to Applied Magnetics Corporation. Method of attaching electrical conductors to thin film magnetic transducer. 4,546,541, Cl. 29-603.000.
Reil, Wilhelm, to Tetra Pak Developement S.A. Apparatus for sealing a liquid pack. 4,546,592, Cl. 53-373.000.
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Allardice, John M., 4,547,544, Cl. 524-267.000.
Rellick, Joseph R., to Du Pont de Nemours, E. I., and Company. Conductive element metallized with a thick film gold composition. 4,547,436, Cl. 428-672.000.
Rennard, Raymond J.: *See*—
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Rheinmetall GmbH: *See*—
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Cassat, Robert; and Vignando, Bruno, 4,547,408, Cl. 427-375.000.
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Ri, Masao; Ohhara, Kenji; Yamamoto, Yoshinori; Takada, Akira; Watanabe, Hisanori; and Osada, Yasuo, to Sony Corporation. Mode changing apparatus. 4,547,823, Cl. 360-90.000.
Ribarits, Peter, to Skischuhfabrik Dynafit Gesellschaft m.b.H. Fastener for sports shoes. 4,546,521, Cl. 24-70.0SK.
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Richards, Gerald P., to Raytheon Company. PPI To raster display scan converter. 4,547,803, Cl. 358-140.000.
Richey, Joseph B.; Wake, Robert H.; Walters, Ronald G.; Hunt, Willard F.; and Cool, Steven L., to Technicare Corporation. Cardiac imaging with CT scanner. 4,547,892, Cl. 378-8.000.
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Riemer, Jed A.; Zanno, Paul R.; and Barnett, Ronald E., to General Foods Corporation. 3-Hydroxy-4-methoxyphenyl benzoates. 4,547,584, Cl. 560-71.000.
Riesen, Peter, to Sulzer Brothers Limited. Device for cleaning the weft insertion area of a weaving machine. 4,546,799, Cl. 139-1.00C.
Riesenfeld, James: *See—*
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Riffe, Delmar R.; Elson, John P.; Sathe, Dilip S.; and Grassbaugh, Walter T., to Copeland Corporation. Refrigeration compressor and method of assembling same. 4,547,131, Cl. 417-53.000.
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Rionda, Carlos S.; and Palacio, Joaquin J., to Gang-Nail Systems, Inc. Seat plate protecting structural members. 4,546,579, Cl. 52-92.000.
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Rivola, Luigi: *See—*
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Rizk, Jihad F., to Polyfab S.A.R.L. Method for producing a modular building unit. 4,546,530, Cl. 29-430.000.
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Roberts, Harold D. Denture support frame. 4,547,158, Cl. 433-176.000.
Roberts, John E., to Watkins Johnson Company. Microwave circuit structure and method of mounting. 4,547,755, Cl. 333-246.000.
Roccaforte, Harry I., to Champion International Corporation. Integral three-ply strap handle. 4,546,914, Cl. 229-52.00B.
Rocha, Henry A. F.; and Harnden, John D., Jr., to General Electric Company. Piezoelectric force/pressure sensor. 4,546,658, Cl. 73-862.590.
Roche, Joseph R., to Hydril Company. Diverter system and blowout preventer. 4,546,828, Cl. 166-84.000.
Rockl, Manfred: *See—*
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Erickson, Alan R.; and Heidt, Marvin W., 4,547,746, Cl. 330-298.000.
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Marchesi, Franco, 4,546,717, Cl. 112-313.000.
Sanvito, Roberto, 4,546,714, Cl. 112-155.000.
Rockwood, Robert E.; and Ximenes, Victor, to A. W. Chesterton Company. Vibration sensor. 4,547,771, Cl. 340-683.000.
Rodgers, Robert L., III, to RCA Corporation. Feedback kinescope driver. 4,547,799, Cl. 358-74.000.
Roeske, Roger W., to Salk Institute For Biological Studies, The. GnRH Antagonists. 4,547,370, Cl. 514-15.000.
Roger, Bernard P.; and Vertongen, Bernard, to U.S. Philips Corporation. CMOS-Bipolar Darlington device. 4,547,791, Cl. 357-43.000.
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Cholod, Michael S., 4,547,563, Cl. 528-173.000.
Hughes, Kathleen A.; and Swift, Graham, 4,547,556, Cl. 526-75.000.
Rohner, Thomas G. Mechanical cooler for electronics. 4,546,619, Cl. 62-419.000.
Rohr, Martin; and Flynn, Cormack, to Givaudan Corporation. Alkyl alpha-campholenates and dihydro derivatives thereof as odorants and flavorants. 4,547,315, Cl. 252-522.00R.
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Rolls-Royce Limited: *See—*
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Rosa, Stephen P., to TVI Energy Corporation. Multi-spectral target. 4,546,983, Cl. 273-348.100.
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Roselli, Sergio. Gasket for joining panels with a level surface. 4,546,986, Cl. 277-184.000.
Ross, Jerry H., to United States of America, Navy. Split-BUS multiprocessor system. 4,547,845, Cl. 364-200.000.
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Roullet, Alain; and Lermuzeaux, Andre , to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Apparatus for providing a continuous stream of a cryogenic liquid and in particular liquid nitrogen. 4,546,609, Cl. 62-49.000.
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Teutsch, Jean-Georges; Torelli, Vesperto; Deraedt, Roger; and Philibert, Daniel, 4,547,493, Cl. 514-179.000.
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Rowlette, John J.; Clough, Thomas J.; Josefowicz, Jack Y.; and Sibert, John W., to Atlantic-Richfield Company; and California Institute of Technology. Unitary plate electrode. 4,547,443, Cl. 429-217.000.
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Royal Co., Ltd.: *See—*
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Ruschmann, Henry W., to Alpha Foils Inc. Apparatus for embossing holograms on metalized thermoplastic films. 4,547,141, Cl. 425-374.000.
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Rutkowski, Richard G.; Dwyer, John J.; and Hoover, John W., to Dictaphone Corporation. Head support and positioning assembly for record/playback device. 4,547,821, Cl. 360-75.000.
Ryan, Carl R.; and Hambley, Allan R., to Motorola, Inc. Recursive adaptive equalizer for SMSK data links. 4,547,888, Cl. 375-14.000.
Rydell, Mark A., to Angiomedics Incorporated. Catheter having embedded multi-apertured film. 4,547,193, Cl. 604-282.000.
S. A. des Etablissements STAUBLI (France): *See—*
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Sakamura, Yoshikazu. Former having continuous forming-rolling assembly. 4,546,630, Cl. 72-68.000.
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Sallinen, Pentti. Soft-cover book block and method for the manufacture of same. 4,547,000, Cl. 281-23.000.
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Mabe, Atsushi; Shimizu, Shigemi; and Kawano, Akihiro, 4,547,138, Cl. 418-55.000.
Terauchi, Kiyoshi; and Hiraga, Masaharu, 4,547,137, Cl. 418-55.000.
Sanderford, Dorsey W., to Cybar Corporation. Pressure translator and system for measuring pressure. 4,546,785, Cl. 137-85.000.
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Sanderson, John R.; Keating, Kenneth P.; Marquis, Edward T.; and Vanderpool, Steven H., to Texaco, Inc. Cobalt borate catalyzed decomposition of organic hydroperoxides. 4,547,598, Cl. 568-922.000.
Sandine, William E.; and Heatherbell, David A., to State of Oregon acting by and through the State Board of Higher Education for and on behalf of Oregon State University. Wine preparation with new strains of *Leuconostoc oenos* . 4,547,373, Cl. 426-15.000.
Sando, Tomoji: *See*—
Iizuka, Eiichi; Sando, Tomoji; and Kashima, Shinji, 4,547,257, Cl. 156-603.000.
Sandoz Ltd.: *See*—
Bolliger, Georg; and Stutz, Peter, 4,547,500, Cl. 514-250.000.
Sandy Hill Corporation: *See*—
Keller, Martin B.; and Ahrens, Roger A., 4,547,266, Cl. 162-252.000.
Sanford, Gary G.; and Paschen, Dean A., to Ball Corporation. Annular slot antenna. 4,547,779, Cl. 343-700.0MS.
Sanford, Norman A.: *See*—
Spillman, William, Jr.; Soref, Richard A.; and Sanford, Norman A., 4,547,262, Cl. 156-659.100.
Sani-Fresh International, Inc.: *See*—
Frassanito, John R., 4,546,904, Cl. 222-185.000.
Sankyo Company Limited: *See*—
Ide, Junya; Muramatsu, Shigeki; Nakada, Yasuo; and Kitano, Noritoshi, 4,547,520, Cl. 514-450.000.
Sano, Takamitsu: *See*—
Kashiwagi, Yoshiyuki; Sano, Takamitsu; and Kitakizaki, Kaoru, 4,547,640, Cl. 200-144.00B.
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Ouchi, Toshiki; and Sano, Yoshiaki, 4,546,695, Cl. 98-121.200.
Sano, Yuji: *See*—
Hashimoto, Hideo; Tomori, Katsuhiko; and Sano, Yuji, 4,547,854, Cl. 364-474.000.
Santen Pharmaceutical Co., Ltd.: *See*—
Iwao, Jun-ichi; Iso, Tadashi; and Oya, Masayuki, 4,547,513, Cl. 514-321.000.
Santhanam, Chakra J., to Arthur D. Little, Inc. Method of producing free flowing solids. 4,546,612, Cl. 62-55.000.
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Sanuki Kogyo Kabushiki Kaisha: *See*—
Sanuki, Sannosuke; and Morikawa, Hideyuki, 4,547,340, Cl. 422-116.000.
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Sanvito, Roberto, to Rockwell-Rimoldi S.p.A. Dual needle bar sewing machine. 4,546,714, Cl. 112-155.000.
Sanyo Electric Co., Ltd.: *See*—
Mitani, Nobuhiro; and Furusawa, Toshihiro, 4,547,807, Cl. 358-213.000.
Sarges, Reinhard, to Pfizer Inc. Method of using [1,2,4]triazolo[4,3-a]quinoxaline-4-amine derivatives as antidepressant and antifatigue agents. 4,547,501, Cl. 514-250.000.
Sarlo, Thomas J. Test panel for tractor and trailer lights. 4,547,722, Cl. 324-51.000.
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Suzuki, Nobuhiko; and Sasaki, Masaya, 4,546,617, Cl. 62-180.000.
Sasaki, Tsuneo; Ohtomo, Fumio; Yokokura, Takashi; and Kondo, Fumitomo, to Tokyo Kogaku Kikai Kabushiki Kaisha. Displacement measuring device utilizing an incremental code. 4,547,667, Cl. 250-231.0SE.
Satake Engineering Co., Ltd.: *See*—
Satake, Toshihiko, 4,546,885, Cl. 209-548.000.
Satake, Toshihiko, to Satake Engineering Co., Ltd. Diagnostic device for color sorting apparatus. 4,546,885, Cl. 209-548.000.
Sathe, Dilip S.: *See*—
Riffe, Delmar R.; Elson, John P.; Sathe, Dilip S.; and Grassbaugh, Walter T., 4,547,131, Cl. 417-53.000.
Sato, Eiji: *See*—
Sumiyoshi, Kikuo; Sato, Eiji; Kojima, Masamitsu; Izumi, Masayoshi; and Miyasaka, Kingo, 4,547,434, Cl. 428-609.000.
Sato, Kiyomi: *See*—
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Sato, Takeshi: *See*—
Goto, Takaharu; Sato, Takeshi; Sakai, Kouzou; and Ii, Motohiko, 4,547,223, Cl. 106-90.000.
Sato, Toshihiko; and Yamagata, Tetsuo, to Honda Giken Kogyo Kabushiki Kaisha. Injector for multicylinder internal combustion engines. 4,546,746, Cl. 123-478.000.
Sauermann, Gerhard: *See*—
Hoppe, Udo; Wittern, Klaus-Peter; Sauermann, Gerhard; Stelling, Otto; and Rockl, Manfred, 4,547,307, Cl. 252-107.000.
Savit, Carl H., to Western Geophysical Company of America. Marine seismic sensor. 4,547,869, Cl. 367-149.000.
Sawada, Toshiichi: *See*—
Fukami, Yasuhiko; Sawada, Toshiichi; and Kinkori, Shuzo, 4,546,733, Cl. 123-52.0MB.
Scalise, Stanley J.: *See*—
Kaminski, Walter R.; and Scalise, Stanley J., 4,547,886, Cl. 372-59.000.

Schaeffer, Norman E. Apparatus for applying agricultural chemicals including contact type herbicides. 4,546,570, Cl. 47-1.500.
Schaeffer, Robert L., to Black & Decker, Inc. Drip coffeemaker hot water generator. 4,546,697, Cl. 99-279.000.
Scheibe, Horst: *See*—
Meyer, Dietmar; and Scheibe, Horst, 4,546,845, Cl. 180-286.000.
Scheibenreif, John A., to ITT Corporation. Modular swivel connector. 4,547,027, Cl. 339-8.00R.
Scheinecker, Alois: *See*—
Scheurecker, Werner; Scheinecker, Alois; Cordella, Johannes; and Engel, Kurt, 4,546,547, Cl. 33-182.000.
Scheinpflug, Hans: *See*—
Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Reinecke, Paul; and Scheinpflug, Hans, 4,547,515, Cl. 514-383.000.
Schenek, Anton: *See*—
Seidel, Adolf; Artzt, Peter; Egbers, Gerhard; Grimm, Helmut; Kunde, Klaus; and Schenek, Anton, 4,546,622, Cl. 66-9.00B.
Schering, Aktiengesellschaft: *See*—
Pfeiffer, Heinrich; Muetzel, Wolfgang; and Speck, Ulrich, 4,547,357, Cl. 424-5.000.
Scheurecker, Werner; Scheinecker, Alois; Cordella, Johannes; and Engel, Kurt, to Voest-Alpine Aktiengesellschaft. Checking and aligning stand to be used in a continuous casting plant. 4,546,547, Cl. 33-182.000.
Scheurer, Robert S.: *See*—
Scheurer, Stephen M.; and Scheurer, Robert S., 4,547,165, Cl. 441-112.000.
Scheurer, Stephen M.; and Scheurer, Robert S. Personal flotation device. 4,547,165, Cl. 441-112.000.
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Maiorana, Stefano; Brocchetti, Diego G.; and Piacenza, Giuseppe, 4,547,495, Cl. 514-211.000.
Schilling, Peter, to Westvaco Corporation. Emulsifiers for bituminous emulsions. 4,547,224, Cl. 106-273.000.
Schilling, Walter W.: *See*—
Churchland, Mark T.; and Schilling, Walter W., 4,546,886, Cl. 209-665.000.
Schindler, Harvey D., to Lummus Crest, Inc. Coal liquefaction and hydrogenation. 4,547,282, Cl. 208-8.0LE.
Schlessinger, Joseph E.; and Hamilton, Richard G., to Critikon. Pulmonary monitor. 4,546,770, Cl. 128-630.000.
Schlumberger Industrie S.A.: *See*—
Vinciguerra, Costantino; and Lephilibert, Jean, 4,546,953, Cl. 251-58.000.
Schlumberger Technology Corporation: *See*—
Sharp, Stanley O., 4,547,833, Cl. 361-386.000.
Thoraval, Yvon, 4,547,733, Cl. 324-338.000.
Valdois, Michel; Maitre, Pierre; Besson, Raymond; and Boy, Jean-Jacques, 4,547,691, Cl. 310-361.000.
Schmadel, Edmund: *See*—
Hase, Christian; Bischoff, Martin; Schmadel, Edmund; and Vogt, Gunther, 4,547,306, Cl. 252-99.000.
Schmale GmbH & Co., KG: *See*—
Schmale, Karl-Ernst, 4,546,878, Cl. 206-343.000.
Schmale, Karl-Ernst, to Schmale GmbH & Co., KG. Band of latch assemblies. 4,546,878, Cl. 206-343.000.
Schmidt, Volkmar: *See*—
Arenhovel, Clemens; Much, Joachim; Onallah, Ali-Maher; and Schmidt, Volkmar, 4,547,142, Cl. 425-378.00R.
Schmitz, Wolfgang. Permanent wave curler. 4,546,781, Cl. 132-31.00R.
Schnee, Edward: *See*—
di Ricco, Leo; Schnee, Edward; Stefanini, Zorro; and Frew, Duncan W., 4,547,534, Cl. 523-324.000.
Schneider, Daniel J.; and Reiter, Jeffrey S., to Standard Oil Company (Indiana). Heating foam container in unrestricted state to increase stiffness. 4,547,412, Cl. 428-35.000.
Schneider, Erich: *See*—
Ratzel, Rudiger; and Schneider, Erich, 4,547,718, Cl. 318-568.000.
Schneider, Gottfried: *See*—
Boehmke, Gunther; Mazanek, Jan; Botsch, Hans-Jurgen; and Schneider, Gottfried, 4,547,199, Cl. 44-51.000.
Schneider, Hartmut, to Siemens Aktiengesellschaft. Process for producing a glass body. 4,547,210, Cl. 65-2.000.
Schneider, Rudolf, to Ateliers des Charmilles, S.A. Process and mechanism for threading the electrode wire of an EDM apparatus. 4,547,647, Cl. 219-69.00W.
Schneider, Wolfgang; and Lenczyk, John P., to B. F. Goodrich Company, The. Process for scavenging free chlorine in an ethylene dichloride stream. 4,547,599, Cl. 570-241.000.
Schneiter, Fred E.; and McDonald, Allan J., to Morton Thiokol, Inc. Gas generant for air bag inflators. 4,547,235, Cl. 149-35.000.
Schoennagel, Hans J.: *See*—
Garwood, William E.; and Schoennagel, Hans J., 4,547,613, Cl. 585-533.000.
Schott, Margaret E.: *See*—
Letsinger, Robert L.; and Schott, Margaret E., 4,547,569, Cl. 536-29.000.
Schoumaker, Raoul J. P.; and Harter, Mark A., to Westinghouse Electric Corp. Universal telescopic stretcher rail system. 4,546,889, Cl. 211-105.300.
Schrank, Helmut E.: *See*—
Bolt, Conway A., Jr.; Cassen, John W.; and Schrank, Helmut E., 4,547,776, Cl. 343-741.000.
Schrank, Martin P., to GTE Products Corporation. Thin film electroluminscent display device. 4,547,702, Cl. 313-509.000.
Schreck, Ronald P.: *See*—
Light, Kenneth K.; Schreiber, William L.; McGhie, Joseph A.; Schreck, Ronald P.; Yoshida, Takao; Schreiber, Loren B.; and Muralidhara, Ranya, 4,547,594, Cl. 568-392.000.
Schreiber, Loren B.: *See*—
Light, Kenneth K.; Schreiber, William L.; McGhie, Joseph A.; Schreck, Ronald P.; Yoshida, Takao; Schreiber, Loren B.; and Muralidhara, Ranya, 4,547,594, Cl. 568-392.000.
Schreiber, William L.: *See*—
Light, Kenneth K.; Schreiber, William L.; McGhie, Joseph A.; Schreck, Ronald P.; Yoshida, Takao; Schreiber, Loren B.; and Muralidhara, Ranya, 4,547,594, Cl. 568-392.000.
Schroeder, George O.: *See*—
Hsu, Joseph C.; Schroeder, George O.; and Steen, Robert A., 4,546,882, Cl. 206-484.000.
Schubert, Richard M.: *See*—
Esders, Theodore W.; Lynn, Shirley Y.; Findlay, John B.; and Schubert, Richard M., 4,547,461, Cl. 435-17.000.
Schuetz, Jeffrey M.: *See*—
Lustig, Stanley; Schuetz, Jeffrey M.; and Vicik, Stephen J., 4,547,413, Cl. 428-35.000.
Schulein, Rolf G.: *See*—
Liebscher, Johannes; and Schulein, Rolf G., 4,546,512, Cl. 15-41.00R.
Schultze, Werner; and Weber, Knut, Jr., to Vereinigte Aluminium-Werke Aktiengesellschaft; and Langlet, Weber KG. Binderless ceramic or ceramic oxide hollow body and method for its manufacture. 4,547,415, Cl. 428-36.000.
Schulz, Donald N.; Kowalik, Ralph M.; Bock, Jan; and Maurer, John J., to Exxon Research and Enginering Co. Drag reduction agent. 4,546,784, Cl. 137-13.000.
Schwallie, Ambrose L.: *See*—
Downs, Robert E.; and Schwallie, Ambrose L., 4,547,335, Cl. 376-442.000.
Schwartz, Reinhard: *See*—
Abt, Jurgen; Handtmann, Dieter; Schwartz, Reinhard; and Wocher, Bertold, 4,546,648, Cl. 73-119.00A.
Schwarz, Gerhard E. Method and apparatus of continuously casting hollow round billets with a hypocycloidal mandrel and an inside rolling process. 4,546,816, Cl. 164-465.000.
Schwarz, Hartmut B., to Bremer Vulkan AG Schiffbau Und Maschinenfabrik. Sailing ship. 4,546,718, Cl. 114-39.000.
Schwarzel, William C.: *See*—
Jasne, Stanley J.; Schwarzel, William C.; Sullivan, Charles I.; and Taylor, Lloyd D., 4,547,451, Cl. 430-215.000.
Sclar, Nathan, to Rockwell International Corporation. Selective access array integrated circuit. 4,547,792, Cl. 357-45.000.
SCM Corporation: *See*—
Brown, George L.; and Spencer, Arthur T., 4,547,535, Cl. 523-404.000.
Carlson, Gary M., 4,547,323, Cl. 260-465.400.
Scott, Junius D.: *See*—
Gotal, John D.; and Scott, Junius D., 4,547,712, Cl. 318-128.000.
Scrivens, Stephen J. Plant watering apparatus. 4,546,571, Cl. 47-81.000.
Sea Co Services Limited: *See*—
Nessfield, Stanley, 4,546,945, Cl. 248-346.000.
Seaman Corporation: *See*—
Seaman, Richard N., 4,546,589, Cl. 52-518.000.
Seaman, Richard N., to Seaman Corporation. Single-ply sealed membrane roofing system. 4,546,589, Cl. 52-518.000.
Sebenik, Roger F.; Baker, Jerry D.; and Laferty, John M., to AMAX Inc. Recovery of molybdenum from spent catalyst solutions obtained from hydroperoxide epoxidations. 4,547,345, Cl. 423-53.000.
Sebulke, Johannes: *See*—
Hagen, Max; and Sebulke, Johannes, 4,546,864, Cl. 192-41.00A.
Secord, Nelson W., to Chrysler Corporation. Mounting structure for throttle control cable. 4,546,666, Cl. 74-501.00P.
Sedgwick, David M.: *See*—
Thorne, William D.; and Sedgwick, David M., 4,546,699, Cl. 101-93.140.
Sedlak, John A.: *See*—
Forgione, Peter S.; Singh, Balwant; and Sedlak, John A., 4,547,265, Cl. 162-164.600.
Segan, Marc C.; Swarztrauber, Sayre A.; and Patterson, Neil K., to Dakin, R. Squeeze switch particularly adapted for use with stuffed toys. 4,547,635, Cl. 200-52.00R.
Segura, Perfecto B. Boxer training aid. 4,546,966, Cl. 272-76.000.
Seher, Fred H.: *See*—
Gioia, Norman F.; and Seher, Fred H., 4,547,698, Cl. 313-414.000.
Seidel, Adolf; Artzt, Peter; Egbers, Gerhard; Grimm, Helmut; Kunde, Klaus; and Schenek, Anton, to Sulzer Morat GmbH. Circular knitting machine for producing knit goods having enmeshed fibers. 4,546,622, Cl. 66-9.00B.
Seiren Co., Ltd.: *See*—
Kojima, Akira; Yoshida, Saburo; Yamada, Yoshio; Shioda, Seiji; and Isoshima, Kazumi, 4,547,423, Cl. 428-315.500.
Seki, Shinji: *See*—
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Sekine, Masaru: *See*—
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Sensormedics Corporation: *See*—
Stupecky, Josef J., 4,546,793, Cl. 137-554.000.
Service National Electricite de France: *See*—
Cormary, Yves; and Nicolas, Christian, 4,546,917, Cl. 236-44.00C.

Hamelin, Jean-Francois; and Combe, Michel, 4,547,879, Cl. 370-86.000.
Seth, Shivaji S.: *See*—
Brogli, Rudolf H.; Shamasunder, Bangalore I.; and Seth, Shivaji S., 4,547,334, Cl. 376-389.000.
Seyfried, Christoph: *See*—
Hausberg, Hans-Heinrich; Bottcher, Henning; Gottschlich, Rudolf; Seyfried, Christoph; and Minck, Klaus-Otto, 4,547,576, Cl. 546-197.000.
Seyler, Edwin E. All-metal live trap. 4,546,568, Cl. 43-61.000.
Shah, Shrenik K.: *See*—
Doherty, James B.; Ashe, Bonnie M.; Finke, Paul E.; Shah, Shrenik K.; Thompson, Kevan R.; and Zimmerman, Morris, 4,547,371, Cl. 514-200.000.
Shamasunder, Bangalore I.: *See*—
Brogli, Rudolf H.; Shamasunder, Bangalore I.; and Seth, Shivaji S., 4,547,334, Cl. 376-389.000.
Shanaberger, Jan L.: *See*—
Turner, Herman E., Jr.; and Shanaberger, Jan L., 4,547,120, Cl. 414-744.00R.
Shapiro, Rafael, to Du Pont de Nemours, E. I., and Company. Thiophene or furan herbicides. 4,547,217, Cl. 71-93.000.
Sharp Kabushiki Kaisha: *See*—
Fujiwara, Katsuyoshi, 4,547,062, Cl. 355-14.00R.
Yamauchi, Juichi, 4,547,643, Cl. 219-10.55R.
Sharp, Stanley O., to Schlumberger Technology Corporation. High density electronics packaging system for hostile environment. 4,547,833, Cl. 361-386.000.
Shattuck, Meredith D., to International Business Machines Corporation. Correctable thermal transfer printing ribbon. 4,547,088, Cl. 400-241.100.
Shaw, Jimmie: *See*—
Bloome, James A.; and Shaw, Jimmie, 4,546,927, Cl. 241-74.000.
Shaw, Rudy L.: *See*—
Tsui, James B. Y.; and Shaw, Rudy L., 4,547,727, Cl. 324-79.00D.
Shedd, Harold E. Power surge isolator. 4,547,827, Cl. 361-55.000.
Sheler, Raymond E.: *See*—
Carr, Jesse M., Jr.; Sheler, Raymond E.; Richards, Frank J.; and Kelder, Eric, 4,547,295, Cl. 210-777.000.
Shell Oil Company: *See*—
Diaz, Zaida, 4,547,619, Cl. 585-824.000.
Neel, Emmanuel E. A.; Levavasseur, Jacques A.; and Lucien, Jacques P., 4,547,283, Cl. 208-46.000.
Shellhause, Ronald L., to General Motors Corporation. Drum brake. 4,546,862, Cl. 188-331.000.
Shen, Chung Y., to Monsanto Company. Hydrolysis of nitrilotriacetonitrile. 4,547,589, Cl. 562-572.000.
Shepard, Joseph F., to International Business Machines Corporation. Method of making submicron FET structure. 4,546,535, Cl. 29-571.000.
Sheppard, Clyde H.: *See*—
Lubowitz, Hyman R.; and Sheppard, Clyde H., 4,547,553, Cl. 525-384.000.
Sherman, Michael I ; and Phillips, Joseph R., to Kamyr, Inc. Method of withdrawing liquid from a pair of vertically spaced annular screens. 4,547,264, Cl. 162-37.000.
Shiba, Kazuo; and Fuwa, Shigehiro, to Citizen Watch Co., Ltd. Grinding machine. 4,546,573, Cl. 51-165.720.
Shibata, Fumio: *See*—
Nakamura, Mamoru; and Shibata, Fumio, 4,547,549, Cl. 525-197.000.
Shibata, Takanori; Yamanaka, Masashige; and Kako, Hiroyuki, to Toyo Contact Lens Co., Ltd. Water-absorptive contact lenses. 4,547,543, Cl. 524-264.000.
Shibata, Toshio; and Sakuma, Koichiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Microwave receiving apparatus using a waveguide filter. 4,547,901, Cl. 455-300.000.
Shibuya, Kiyoshi; Yukumoto, Masao; Kan, Takahiro; and Ito, Yo, to Kawasaki Steel Corporation. Process and apparatus for the production of rapidly solidified metallic tapes by double-roll system. 4,546,814, Cl. 164-455.000.
Shields, Edward P.; and Bassler, Elmer A., Jr., to Westinghouse Electric Corp. Nuclear fuel rod bundle drive apparatus. 4,547,117, Cl. 414-404.000.
Shigematsu, Takashi; and Watanabe, Tomoyuki, to Toyota Jidosha Kabushiki Kaisha. Control for vehicle provided with continuously variable speed system power transmission. 4,546,673, Cl. 74-866.000.
Shigeta, Masatomo; and Fukuda, Hiroyuki, to Kureha Kagaku Kogyo Kabushiki Kaisha. Ribbed substrate for fuel cell electrode. 4,547,418, Cl. 428-167.000.
Shiina, Koji; Sakaguchi, Seiichiro; and Akatsu, Yasuaki, to Hitachi, Ltd. Thermo-siphon type generator apparatus. 4,546,608, Cl. 60-649.000.
Shikano, Tohru: *See*—
Arai, Masayuki; Ogasawara, Terumi; and Shikano, Tohru, 4,547,808, Cl. 358-228.000.
Shimada, Fumio: *See*—
Kojima, Yasuo; and Shimada, Fumio, 4,547,456, Cl. 430-330.000.
Shimano Industrial Company Limited: *See*—
Hideo, Noda, 4,546,937, Cl. 242-219.000.
Nagano, Masashi, 4,546,858, Cl. 188-24.190.
Shimizu, Katsunori: *See*—
Takada, Tadakazu; and Shimizu, Katsunori, 4,547,260, Cl. 156-643.000.
Shimizu, Motoharu; Noda, Noriyuki; and Noguchi, Yoshihiro, to Hitachi Metals, Ltd. Cylindrical permanent magnet and method of manufacturing. 4,547,758, Cl. 335-302.000.
Shimizu, Shigemi: *See*—
Mabe, Atsushi; Shimizu, Shigemi; and Kawano, Akihiro, 4,547,138, Cl. 418-55.000.
Shimogawa, Toshiaki: *See*—
Nishimura, Yuji; Fujiwara, Akinori; Kawaguchi, Teruhiko; Shimogawa, Toshiaki; and Sakakibara, Kazuo, 4,546,934, Cl. 242-107.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Hamaguchi, Toshiaki; Namikawa, Kazuhira; Goshima, Toshikazu; Nakamura, Mutsuaki; Kuroda, Akio; and Kudo, Yoshiaki, 4,547,545, Cl. 524-269.000.
Shinbara, Seitaro, to Tokyo Shibaura Denki Kabushiki Kaisha. Amplitude modulator with three differential transistor pairs. 4,547,752, Cl. 332-31.00T.
Shinoda, Kazuo: *See*—
Igashira, Toshihiko; Sakakibara, Yasuyuki; Abe, Seiko; Koide, Hiroshi; and Shinoda, Kazuo, 4,546,749, Cl. 123-506.000.
Shinoda, Nobuhiko: *See*—
Kitagishi, Nozomu; Yamaguchi, Shin; Sakai, Shinji; Kinoshita, Takao; Kawabata, Takashi; Shinoda, Nobuhiko; and Hosoe, Kazuya, 4,547,663, Cl. 250-201.000.
Shinohara, Hironobu; Kubota, Kiyonobu; and Yoshida, Yoshinori, to Japan Synthetic Rubber Co., Ltd. Slurry composition of solid fuel. 4,547,200, Cl. 44-51.000.
Shinozaki, Tadashi: *See*—
Okamoto, Yoshio; Iwai, Kazumi; Inoue, Hiroshi; Kunugi, Yoshifumi; and Shinozaki, Tadashi, 4,546,795, Cl. 137-624.150.
Shioda, Seiji: *See*—
Kojima, Akira; Yoshida, Saburo; Yamada, Yoshio; Shioda, Seiji; and Isoshima, Kazumi, 4,547,423, Cl. 428-315.500.
Shiotsu, Osamu: *See*—
Nakata, Yukio; and Shiotsu, Osamu, 4,547,751, Cl. 332-16.00R.
Shirahata, Ryuji; Sekine, Masaru; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Apparatus for manufacturing magnetic recording media. 4,546,725, Cl. 118-718.000.
Shirai, Shigeru; Ogawa, Kyosuke; Kanbe, Junichiro; Saitoh, Keishi; Osato, Yoichi; and Misumi, Teruo, to Canon Kabushiki Kaisha. Photoconductive member comprising silicon and oxygen. 4,547,448, Cl. 430-84.000.
Shiseido Company Ltd.: *See*—
Kubo, Sanae; and Nakamura, Fumiaki, 4,547,365, Cl. 424-71.000.
Shivers, Charles B., Jr. Carburetor for internal combustion engines. 4,547,325, Cl. 261-65.000.
Shore, Jack. Cleaning of surface of an object. 4,547,401, Cl. 427-161.000.
Showa Aluminum Kabushiki Kaisha: *See*—
Ejima, Tatsuhiko; Arai, Kozo; Isoyama, Eizo; and Fujihira, Tadao, 4,547,275, Cl. 204-129.750.
Showa Denko Kabushiki Kaisha: *See*—
Iizuka, Eiichi; Sando, Tomoji; and Kashima, Shinji, 4,547,257, Cl. 156-603.000.
Showa Manufacturing Co., Ltd.: *See*—
Tanno, Satoru, 4,546,959, Cl. 267-64.150.
Shrawder, Carl F.; and Randall, Peter. Cable locking mechanism. 4,546,627, Cl. 70-18.000.
Shuto, Katsuichi: *See*—
Kumazawa, Toshiaki; Oiji, Yoshimasa; Tanaka, Hiroshi; and Shuto, Katsuichi, 4,547,496, Cl. 514-218.000.
Shuttleworth, John: *See*—
Smyers, Eugene D., 4,546,997, Cl. 280-772.000.
Shyr, Yen-Shin, to Phillips Petroleum Company. Catalyst and method of preparing catalyst. 4,547,486, Cl. 502-333.000.
Sibert, John W.: *See*—
Rowlette, John J.; Clough, Thomas J.; Josefowicz, Jack Y.; and Sibert, John W., 4,547,443, Cl. 429-217.000.
Sidler, Hans: *See*—
Stalder, Hans; and Sidler, Hans, 4,546,788, Cl. 137-242.000.
Siegell, Jeffrey H.: *See*—
Cahn, Robert P.; and Siegell, Jeffrey H., 4,546,552, Cl. 34-1.000.
Siegemund, Gunter: *See*—
Muller, Thomas; and Siegemund, Gunter, 4,547,483, Cl. 502-226.000.
Siemens Aktiengesellschaft: *See*—
Heider, Ulrich; and Kern, Hans, 4,547,087, Cl. 400-144.200.
Herbst, Heiner; and Koch, Rudolf, 4,547,806, Cl. 358-212.000.
Krummel, Peter, 4,547,706, Cl. 315-226.000.
Muller, Erwin, 4,547,759, Cl. 336-192.000.
Raisig, Hermann; Unger, Gregor; and Wirbser, Oscar, 4,547,652, Cl. 219-121.0LD.
Schneider, Hartmut, 4,547,210, Cl. 65-2.000.
Von Sichart, Frithjof; and Wiedeburg, Klaus, 4,547,765, Cl. 340-347.0DD.
Siemens Corporate Research & Support, Inc.: *See*—
Tsikos, Constantine, 4,547,668, Cl. 250-231.00P.
Tsikos, Constantine J., 4,547,898, Cl. 382-4.000.
Siemens Gammasonics, Inc.: *See*—
Groch, Mark W.; and Domnanovich, James R., 4,546,777, Cl. 128-715.000.
Siffrin, Horst, to Walter Becker GmbH. Rail-mounted conveyance. 4,546,707, Cl. 105-199.00R.
Silberman, Ira J., to Diversified Products Corporation. Adjustable bench mounted leg lift exerciser. 4,546,968, Cl. 272-117.000.
Silchor: *See*—
Houle, Raymond T.; Kilbourn, Frederick A.; De Kraker, James E.; and Nilsson, Robert T., 4,546,506, Cl. 4-555.000.
Silicon Electro-Physics, Inc.: *See*—
Santini, William A., Jr., 4,547,259, Cl. 156-607.000.

Silver, Myron E.; and Wisdom, Lawrence W., to Frito-Lay, Inc. Fruit chip product and process for making same. 4,547,376, Cl. 426-102.000.

Sim, F. Thomas; Ancillai, Louis D.; and Leikam, Carson, to Croll-Reynolds Engineering Co., Inc. Heel recovery filtration process and apparatus. 4,547,296, Cl. 210-778.000.

Simon, Kalman: *See*—
Martinko, Matyas; Elekes, Andras; Simon, Kalman; Bohnert, Jozef; Nemeth, Janos; Bole, Karoly; and Ilyes, Zoltan, 4,547,098, Cl. 405-291.000.

Simone, Andre A.: *See*—
Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Ogren, Dennis F.; Nakaniwa, Mikio; and Furukawa, Kenji, 4,547,284, Cl. 208-50.000.

Simonsson, Berit I.: *See*—
Lundin, Claes O. A.; and Simonsson, Berit I., 4,547,481, Cl. 502-160.000.

Singh, Balwant: *See*—
Forgione, Peter S.; Singh, Balwant; and Sedlak, John A., 4,547,265, Cl. 162-164.600.

Sipiano, Michele. Motor roller-skate. 4,546,841, Cl. 180-181.000.

Sistag, Maschinenfabrik Sidler AG: *See*—
Stalder, Hans; and Sidler, Hans, 4,546,788, Cl. 137-242.000.

Sizelove, Cary L.: *See*—
Dietrich, William J., Sr.; and Sizelove, Cary L., 4,546,832, Cl. 172-260.500.

Skanemejerier Ek. For.: *See*—
Lindstam, Nils C., 4,547,385, Cl. 426-570.000.

SKF Kugellagerfabriken GmbH: *See*—
Meining, Hans; and Hans, Rudiger, 4,547,084, Cl. 384-576.000.

Skinner, James L., to Atlantic Richfield Company. Method for discharging treated coal and controlling emissions from a heavy oil spray system. 4,547,198, Cl. 44-1.00R.

Skischuhfabrik Dynafit Gesellschaft m.b.H.: *See*—
Ribarits, Peter, 4,546,521, Cl. 24-70.0SK.

Skovhoj, Jens B. Lawn and garden maintenance apparatus. 4,546,601, Cl. 56-249.000.

Slager, James: *See*—
Louie, Glenn; Retter, Rafi; and Slager, James, 4,547,849, Cl. 364-200.000.

Slana, Matthew F.: *See*—
Lehman, Harvey R.; and Slana, Matthew F., 4,547,877, Cl. 370-58.000.

Slemon, Clarke E.: *See*—
Bharucha, Kekhusroo R.; and Slemon, Clarke E., 4,547,271, Cl. 204-59.00R.

Smith, Carl W. Cement injection device. 4,546,767, Cl. 128-92.00E.

Smith, George E.: *See*—
Stone, Richard J.; Dunegan, Luther H.; and Smith, George E., 4,546,640, Cl. 73-19.000.

Smith Kline & French Laboratories Limited: *See*—
Ife, Robert J., 4,547,506, Cl. 514-272.000.
Jones, Martin; and Young, Rodney C., 4,547,512, Cl. 514-341.000.

Smith, Max D., to Indian Industries, Inc. Yoke anchor for compound bows. 4,546,754, Cl. 124-86.000.

Smith, Nathan L.: *See*—
Turanchik, Michael F.; Yeung, Kwok K.; and Smith, Nathan L., 4,547,466, Cl. 436-509.000.

Smith, Peter H., to General Electric Company. Combination microwave and thermal self-cleaning oven with an automatic venting arrangement. 4,547,642, Cl. 219-10.55B.

Smith, Robert P.; Gillespie, William S.; Inglis, Hal L.; and Hoyne, Donald B., to American Can Company. Material handling method and apparatus therefor. 4,547,645, Cl. 219-10.670.

Smith, Stephen H.: *See*—
Metzner, Robert G.; and Smith, Stephen H., 4,547,678, Cl. 290-40.00C.

Smith, Wayne R.: *See*—
Daigle, Verlon C.; and Smith, Wayne R., 4,547,096, Cl. 405-251.000.

Smith, William H., to Manville Service Corporation. Method for applying a layer of fiber on a surface. 4,547,403, Cl. 427-196.000.

Smith, William L.: *See*—
Mathur, Pershottam P.; and Smith, William L., 4,547,514, Cl. 514-327.000.

Smyers, Eugene D., to Shuttleworth, John. Vehicle steering and suspension system. 4,546,997, Cl. 280-772.000.

Snyder, Walter W.; and Dettmer, Dennis G., to National Can Corporation. Method for producing seamless container bodies. 4,546,636, Cl. 72-346.000.

Sochor, Josef, to Robert Bosch GmbH. Method of recording digital audio and video signals in the same track. 4,547,816, Cl. 360-19.100.

Societe Anonyme dite Manufacture de Produit Chimiques Protex: *See*—
Balland, Jean, 4,547,196, Cl. 8-496.000.

Societe de Procedes et Etudes Soma Minerva: *See*—
Leboime, Pierre R., 4,546,672, Cl. 74-674.000.

Societe Francaise des Produits pour Catalyse Pro-Catalyse: *See*—
Cosyns, Jean; and Boitiaux, Jean-Paul, 4,547,600, Cl. 585-259.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See*—
Bouiller, Jean G.; Buisson, Marc F. B.; Jourdain, Gerard E. A.; Sandelis, Denis J. M.; and Urruty, Yves R. A., 4,546,606, Cl. 60-262.000.

Socol, Michael. Fetal pulmonary maturity test. 4,547,464, Cl. 436-2.000.

Soederhuyzen, Eduard. Connecting pipe part of a resilient material. 4,547,005, Cl. 285-58.000.

Soejima, Tomohide: *See*—
Torizuka, Hideki; Soejima, Tomohide; and Hori, Shigekazu, 4,547,750, Cl. 331-99.000.

Sofranko, John A.; and Withers, Howard P., Jr., to Atlantic Richfield Company. Methane conversion. 4,547,610, Cl. 585-500.000.

Sofranko, John A.: *See*—
Jones, C. Andrew; Leonard, John J.; and Sofranko, John A., 4,547,607, Cl. 585-500.000.
Jones, C. Andrew; and Sofranko, John A., 4,547,611, Cl. 585-500.000.

Soga, Hirokazu: *See*—
Terano, Minoru; Soga, Hirokazu; Inoue, Masuo; and Miyoshi, Katsuyoshi, 4,547,476, Cl. 502-127.000.

Solar, Mladen. Method and apparatus for assisting human heart function. 4,546,759, Cl. 128-1.00D.

Son, Pyong N.: *See*—
Lai, John T.; and Son, Pyong N., 4,547,538, Cl. 524-100.000.

Sony Corporation: *See*—
Henmi, Fumiaki; and Aoki, Yoshio, 4,547,872, Cl. 369-45.000.
Iwase, Seiichiro; Asaida, Takashi; and Nagumo, Fumio, 4,547,796, Cl. 358-13.000.
Katakura, Masayuki, 4,547,741, Cl. 330-149.000.
Kojima, Akira; Yoshida, Saburo; Yamada, Yoshio; Shioda, Seiji; and Isoshima, Kazumi, 4,547,423, Cl. 428-315.500.
Majima, Osamu; and Honda, Shigemichi, 4,547,392, Cl. 427-40.000.
Mori, Yoshihisa; and Takashima, Mitsuru, 4,547,874, Cl. 369-139.000.
Murakami, Yoshikazu; and Yamada, Hiromi, 4,547,754, Cl. 333-219.000.
Ri, Masao; Ohhara, Kenji; Yamamoto, Yoshinori; Takada, Akira; Watanabe, Hisanori; and Osada, Yasuo, 4,547,823, Cl. 360-90.000.
Uedaira, Satoru; Yamanoi, Hiroshi; Suzuki, Masayuki; Tamura, Hidemasa; and Suzuki, Hiroyuki, 4,547,355, Cl. 423-593.000.

Soref, Richard A.: *See*—
Spillman, William, Jr.; Soref, Richard A.; and Sanford, Norman A., 4,547,262, Cl. 156-659.100.

Sorriero, Louis J.: *See*—
Alexandrovich, Peter S.; Sorriero, Louis J.; and Sreekumar, Chandra, 4,547,449, Cl. 430-115.000.

Southgate, Peter D., to RCA Corporation. Thermally isolated imager. 4,547,809, Cl. 358-229.000.

Southwest Research Institute: *See*—
O'Neal, Glenn B., 4,546,735, Cl. 123-90.170.
Winquist, Knut L., 4,546,924, Cl. 239-533.400.

Sovis, John F.; and Balch, John A., to Royal Appliance Mfg. Co. Vacuum cleaner. 4,547,206, Cl. 55-255.000.

Sovonics Solar Systems: *See*—
Hack, Michael; and Guha, Subhendu, 4,547,621, Cl. 136-249.0TJ.

Spademan, Richard G. Shoe with shock absorbing and stabiizing means. 4,546,555, Cl. 36-28.000.

Spaderna, Dieter W.: *See*—
Reese, Edmund A.; Spaderna, Dieter W.; and Flannagan, Stephen T., 4,547,867, Cl. 365-189.000.

Spaude, Heinz-Werner, to Daimler-Benz Aktiengesellschaft. Equipment for recognizing misfiring. 4,547,734, Cl. 324-395.000.

Spaulding, Carl P. Positional control system employing induction motor and electronic braking thereof. 4,547,692, Cl. 318-592.000.

Speck, Ulrich: *See*—
Pfeiffer, Heinrich; Muetzel, Wolfgang; and Speck, Ulrich, 4,547,357, Cl. 424-5.000.

Spector, George: *See*—
Baxter, Otela; and Spector, George, 4,546,965, Cl. 272-56.50R.
Josyula, Bhagavan V.; and Spector, George, 4,547,091, Cl. 402-12.000.

Speer, Billy L. Hem folding machine. 4,546,713, Cl. 112-141.000.

Spencer, Arthur T.: *See*—
Brown, George L.; and Spencer, Arthur T., 4,547,535, Cl. 523-404.000.

Spencer, Robert A., Jr., to Surface Technology, Inc. Electroless metal coatings incorporating particulate matter of varied nominal sizes. 4,547,407, Cl. 427-367.000.

Sperry Corporation: *See*—
Mick, Perry J., 4,547,797, Cl. 358-27.000.
Spillman, William, Jr.; Soref, Richard A.; and Sanford, Norman A., 4,547,262, Cl. 156-659.100.

Spetsialnoe Konstruktorskoe Bjuro "Transprogress": *See*—
Alexandrov, Adolf M.; Bulginov, Evgeny F.; Yashin, Jury A.; and Kiselev, Igor V., 4,547,099, Cl. 406-149.000.

Spillman, William, Jr.; Soref, Richard A.; and Sanford, Norman A., to Sperry Corporation. Method for forming thin film passive light waveguide circuit. 4,547,262, Cl. 156-659.100.

Spiro, Clifford L., to General Electric Company. Supermicronized process for coal comminution. 4,546,925, Cl. 241-1.000.

Spivack, John D.; and Pastor, Stephen D., to Ciba-Geigy Corporation. Substituted (4-hydroxyphenylthio) succinic anhydride or succinate stabilizers. 4,547,539, Cl. 524-112.000.

Sprague Electric Company: *See*—
Efford, Thomas W.; and Moresi, Joseph A., Jr., 4,547,829, Cl. 361-306.000.

Spurway Cooke Industries Pty., Ltd.: *See*—
Elias, Anthony J., 4,546,637, Cl. 72-391.000.

Squirt & Company: *See*—
Kryger, Allen C., 4,547,384, Cl. 426-548.000.

Sreekumar, Chandra: *See—*
Alexandrovich, Peter S.; Sorriero, Louis J.; and Sreekumar, Chandra, 4,547,449, Cl. 430-115.000.

Stahlecker, Otto: *See—*
Herz, Claus P.; Ohngemach, Jorg; and Stahlecker, Otto, 4,547,394, Cl. 427-54.100.

Stalder, Hans; and Sidler, Hans, to Sistag, Maschinenfabrik Sidler AG. Slide valve construction. 4,546,788, Cl. 137-242.000.

Stalhandske, Lars J. T.: *See—*
Eriksoo, Edgar; Sandberg, Eva B.; and Stalhandske, Lars J. T., 4,547,511, Cl. 514-312.000.

Stamicarbon B.V.: *See—*
Kleintjens, Ludovicus A. L.; and Grooten, Hubertus M. J., 4,547,587, Cl. 562-494.000.

Standard Microsystems Corporation: *See—*
Pechar, Henry, 4,547,684, Cl. 307-481.000.

Standard Oil Company (Indiana): *See—*
Schneider, Daniel J.; and Reiter, Jeffrey S., 4,547,412, Cl. 428-35.000.

Stange, Klaus K., to Xerox Corporation. Moving magnet cleaner. 4,547,063, Cl. 355-15.000.

State of Oregon acting by and through the State Board of Higher Education for and on behalf of Oregon State University: *See—*
Sandine, William E.; and Heatherbell, David A., 4,547,373, Cl. 426-15.000.

Statham, John A. Protection of vessels and equipment from moving ice. 4,547,093, Cl. 405-61.000.

Stauffer Chemical Company: *See—*
Jacobs, Barry A.; and Reale, Michael J., 4,547,528, Cl. 521-121.000.
Wehrenberg, Peter K., 4,547,582, Cl. 560-060.000.
Wong, Rayman Y.; and Bunker, Nathan S., 4,547,324, Cl. 260-502.40R.

Stauffer, Robert E., to Dresser Industries, Inc. Front wheel assist drive for a vehicle machine. 4,546,844, Cl. 180-243.000.

Steacy, Paul C., to UOP Inc. Dehydrocyclodimerization process. 4,547,205, Cl. 55-25.000.

Stechschulte, Theodore J.: *See—*
Keglewitsch, Josef; and Stechschulte, Theodore J., 4,547,036, Cl. 339-186.00R.

Steele, David C., to Moose Products, Inc. Printed circuit board for activating and deactivating alarm systems. 4,547,767, Cl. 340-500.000.

Steen, Robert A.: *See—*
Hsu, Joseph C.; Schroeder, George O.; and Steen, Robert A., 4,546,882, Cl. 206-484.000.

Stefanini, Zorro: *See—*
di Ricco, Leo; Schnee, Edward; Stefanini, Zorro; and Frew, Duncan W., 4,547,534, Cl. 523-324.000.

Stein, Robert W.: *See—*
Brunell, Jack W.; and Stein, Robert W., 4,546,750, Cl. 123-514.000.

Steinhart, Horst K., to Rima Enterprises. Signature handling apparatus. 4,547,112, Cl. 414-31.000.

Stelling, Otto: *See—*
Hoppe, Udo; Wittern, Klaus-Peter; Sauermann, Gerhard; Stelling, Otto; and Rockl, Manfred, 4,547,307, Cl. 252-107.000.

Steltenkamp, Robert J.; Douglass, Miriam L.; and Natarelli, Gerard E., to Colgate-Palmolive Company. Stabilizing of cinnamic aldehyde-containing flavors with propylene glycol and dipropylene glycol. 4,547,361, Cl. 424-49.000.

Stenstrom, Lennart: *See—*
Hellman, Per-Ake; and Stenstrom, Lennart, 4,547,831, Cl. 361-127.000.

Stephenson, Michael J.: *See—*
Eby, Robert S.; Stephenson, Michael J.; Andrews, Deborah H.; and Hamilton, Thomas H., 4,546,611, Cl. 62-54.000.

Sternaman, Larry D.: *See—*
De Vita, Joseph P.; Mulder, Thomas J.; O'Mohundro, Kenneth J.; Wellington, Leslie J.; Deeter, Wayne R.; and Sternaman, Larry D., 4,547,880, Cl. 370-91.000.

Stewart, Isaac, Jr. Sno-Rak. 4,547,011, Cl. 294-54.500.

Steyr-Daimler-Puch Aktiengesellschaft: *See—*
Visek, Tomas, 4,546,738, Cl. 123-195.00C.

Sticher, Charles K., Jr.; and Hartley, Michael D., to Nordson Corporation. Power control unit. 4,547,657, Cl. 219-492.000.

Stiefel, Edward I.; Pan, Wie-Hin; and McKenna, Stephen, to Exxon Research and Engineering Co. Compounds containing the $[Co(-MoS_4)_2]^{3-}$ trianion and their preparation. 4,547,321, Cl. 556-14.000.

Stitt, Edward M., to Allenberg, Sam. Pressure sensitive label with surface conforming lobes. 4,547,001, Cl. 283-81.000.

Stol, Israel, to Westinghouse Electric Corp. Method and apparatus for arc welding. 4,547,654, Cl. 219-137.0PS.

Stoller Enterprises, Inc.: *See—*
Stoller, Jerry H., 4,547,213, Cl. 71-53.000.

Stoller, Jerry H., to Stoller Enterprises, Inc. Rock phosphate/sulfur fertilizer composition. 4,547,213, Cl. 71-53.000.

Stolzer, Rainer: *See—*
Lotter, Manfred; and Stolzer, Rainer, 4,546,692, Cl. 92-12.200.

Stone, Richard J.; Dunegan, Luther H.; and Smith, George E. Positive air gas detector. 4,546,640, Cl. 73-19.000.

Stranahan, Michael: *See—*
Lew, Hyok S.; and Stranahan, Michael, 4,546,792, Cl. 137-527.000.

Strauss, Paul, to Zenith Electronics Corporation. Tension mask registration and supporting system. 4,547,696, Cl. 313-407.000.

Striker, Richard P.: *See—*
Dunn, James C.; Hardee, Harry C.; and Striker, Richard P., 4,547,080, Cl. 374-135.000.

Strouss, Oran L. Pan release agent and its preparation. 4,547,388, Cl. 426-609.000.

Stubblefield, Jerry D., to Pensa, Inc. Basketball shoe sole. 4,546,556, Cl. 36-32.00R.

Stubbs, John K.: *See—*
Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., 4,547,502, Cl. 514-253.000.

Stuckey, William C. Universal ratcheting wrench. 4,546,678, Cl. 81-90.600.

Stull, Gene. Tamper-evident closure cap construction. 4,546,893, Cl. 215-252.000.

Stupecky, Josef J., to Sensormedics Corporation. Breath switch. 4,546,793, Cl. 137-554.000.

Sturges, Fred D., to Borg-Warner Corporation. Temperature control system for internal combustion engine. 4,546,742, Cl. 123-41.050.

Stutz, Peter: *See—*
Bolliger, Georg; and Stutz, Peter, 4,547,500, Cl. 514-250.000.

Suciu, Gabriel L.: *See—*
Mortimer, Thomas P.; and Suciu, Gabriel L., 4,546,605, Cl. 60-226.100.

Suda, Masashi: *See—*
Tamura, Yasuyuki; Nakaoka, Masaki; Miyagi, Ken; Nogashima, Nao; Sue, Yasuhiko; Suda, Masashi; and Ariga, Masao, 4,547,628, Cl. 178-2.00B.

Sue, Yasuhiko: *See—*
Tamura, Yasuyuki; Nakaoka, Masaki; Miyagi, Ken; Nogashima, Nao; Sue, Yasuhiko; Suda, Masashi; and Ariga, Masao, 4,547,628, Cl. 178-2.00B.

Suganuma, Testuya: *See—*
Kazuoka, Koji; Suganuma, Testuya; Motooka, Naoki; and Kuroishi, Nobuhito, 4,546,737, Cl. 123-188.00S.

Sugimori, Seiji: *See—*
Matsuoka, Toshio; Kurozu, Shinichi; and Sugimori, Seiji, 4,547,219, Cl. 75-29.000.

Sugimoto, Hiroshi; and Naruse, Yujiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Two-dimensional radiation detecting apparatus. 4,547,670, Cl. 250-370.000.

Sugimura, Masaru: *See—*
Takano, Motoharu; Sugimura, Masaru; Kushima, Keiichi; and Ezaki, Atae, 4,547,343, Cl. 422-304.000.

Sugishita, Nobuyuki: *See—*
Tosaki, Hiromi; Tanei, Hirayoshi; Ikegami, Akira; and Sugishita, Nobuyuki, 4,547,625, Cl. 174-68.500.

Sugita, Masatoshi: *See—*
Tamai, Kenzo; Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Tsuda, Hisatsugu; Sakai, Hiroshi; Sugita, Masatoshi; Yamamoto, Yoshiko; Minami, Hisashi; and Hori, Takako, 4,547,462, Cl. 435-72.000.

Sugita, Ryuji; and Kunieda, Toshiaki, to Matsushita Electric Industrial Co., Ltd. Method for manufacturing magnetic recording medium. 4,547,398, Cl. 427-132.000.

Sugita, Yutaka: *See—*
Kodama, Naoki; Takeshita, Masatoshi; Suzuki, Ryo; Takeuchi, Teruaki; and Sugita, Yutaka, 4,547,865, Cl. 365-12.000.

Sugiyama, Tomokazu: *See—*
Kurata, Hidenori; Inaba, Kazuo; Sugiyama, Tomokazu; and Hirata, Tomio, 4,547,655, Cl. 219-204.000.

Sugiyama, Toshio; and Yamane, Yoshio, to Hitachi, Ltd. Two dimensional actuator for moving optical medium of scanning device. 4,547,871, Cl. 369-44.000.

Suinat, Jean-Pierre A.; and Suinat, Rene P. J., to Anciens Ateliers Macler P. Suinat & Cie Srs. Hooded stopper. 4,546,894, Cl. 215-354.000.

Suinat, Rene P. J.: *See—*
Suinat, Jean-Pierre A.; and Suinat, Rene P. J., 4,546,894, Cl. 215-354.000.

Suizu, Yohji: *See—*
Ueno, Kazunori; and Suizu, Yohji, 4,546,580, Cl. 52-126.100.

Suleske, Aaron A.: *See—*
Coles, Russell I.; Griest, Norman J.; Marando, Raoul J.; and Suleske, Aaron A., 4,547,164, Cl. 441-84.000.

Sullivan, Charles I.: *See—*
Jasne, Stanley J.; Schwarzel, William C.; Sullivan, Charles I.; and Taylor, Lloyd D., 4,547,451, Cl. 430-215.000.

Sullivan, Richard E., to Critikon, Inc. Moisture detector for respiratory monitoring systems. 4,546,778, Cl. 128-718.000.

Sulzer Brothers Limited: *See—*
Ammann, Heinz, 4,546,731, Cl. 122-367.00R.
Riesen, Peter, 4,546,799, Cl. 139-1.00C.

Sulzer-Escher Wyss Ltd.: *See—*
Winkler, Robert, 4,547,197, Cl. 23-302.00T.

Sulzer Morat GmbH: *See—*
Seidel, Adolf; Artzt, Peter; Egbers, Gerhard; Grimm, Helmut; Kunde, Klaus; and Schenek, Anton, 4,546,622, Cl. 66-9.00B.

Sumitomo Chemical Company, Limited: *See—*
Suzukamo, Gohfu; Tamura, Mitsuhisa; and Fukao, Masami, 4,547,586, Cl. 560-211.000.
Yamatsuta, Kohji; and Nishio, Ken-ichi, 4,547,435, Cl. 428-614.000.

Sumitomo Electric Industries, Ltd.: *See—*
Kazuoka, Koji; Suganuma, Testuya; Motooka, Naoki; and Kuroishi, Nobuhito, 4,546,737, Cl. 123-188.00S.
Yoshida, Kenichi; Yokohara, Takashi; Ono, Kimizo; Nishiwaki, Yoshikazu; and Tsuno, Koichi, 4,547,072, Cl. 356-350.000.
Yuto, Masao; and Suzuki, Yoichi, 4,547,328, Cl. 264-45.900.

Sumitomo Gomu Kogyo Kabushiki Kaisha: *See—*
Nagao, Masatoshi, 4,546,856, Cl. 182-228.000.

Sumitomo Heavy Industries, Ltd.: *See*—
Matsuoka, Toshio; Kurozu, Shinichi; and Sugimori, Seiji, 4,547,219, Cl. 75-29.000.

Sumitomo Light Metal Industries Ltd.: *See*—
Ohashi, Azusa; Sakaki, Hirokazu; Nakanishi, Haruo; Tanabe, Zenichi; Tsuchida, Shin; and Hayashi, Yoshikatsu, 4,547,274, Cl. 204-129.400.

Sumiyoshi, Kikuo; Sato, Eiji; Kojima, Masamitsu; Izumi, Masayoshi; and Miyasaka, Kingo, to Oiles Industry Co., Ltd. Heat-resistant shift member. 4,547,434, Cl. 428-609.000.

Summagraphics Corporation: *See*—
Ferrara, Daniel A., 4,546,948, Cl. 248-454.000.

Sun Chemical Corporation: *See*—
Floyd, William C., 4,547,580, Cl. 549-379.000.

Sunbeam Corporation: *See*—
Crowley, George C., 4,547,658, Cl. 219-539.000.

Sundstrand Corporation: *See*—
Hucker, David J., 4,547,843, Cl. 363-67.000.

Sunpower, Inc.: *See*—
Wood, James G., 4,546,663, Cl. 74-40.000.

Superior Graphite Company: *See*—
Goldberger, William M.; and Reed, Allen K., 4,547,430, Cl. 428-404.000.

Superior Plastic Products Corp.: *See*—
Brodsky, David L.; and Olsen, Harry O., Jr., 4,547,192, Cl. 604-270.000.

Superior S.A.: *See*—
Castanier, Philippe, 4,547,006, Cl. 292-37.000.

Sure Stop Manufacturing, Inc.: *See*—
Towle, Alan L.; and Towle, Milton A., 4,546,984, Cl. 273-404.000.

Surface Technology, Inc.: *See*—
Spencer, Robert A., Jr., 4,547,407, Cl. 427-367.000.

Sutherland, Charles A.: *See*—
Musser, John H.; and Sutherland, Charles A., 4,547,509, Cl. 514-311.000.

Suzukamo, Gohfu; Tamura, Mitsuhisa; and Fukao, Masami, to Sumitomo Chemical Company, Limited. Preparation of 2-isopropenyl-or 2-isopropylidenyl-3-hexenoates from chrysanthemic acid esters. 4,547,586, Cl. 560-211.000.

Suzuki, Akira; Oumi, Takeharu; Takamiya, Sanshiro; and Nakazawa, Hideo, to Aisin Seiki Kabushiki Kaisha. Artificial heart driving apparatus. 4,546,760, Cl. 128-1.00D.

Suzuki, Hajime. Food processor. 4,546,928, Cl. 241-95.000.

Suzuki, Hirosuke, to Junkosha Company, Ltd. Compression resistant expanded, porous polytetrafluoroethylene composite. 4,547,424, Cl. 428-316.600.

Suzuki, Hiroyoshi; and Washino, Shoichi, to Mitsubishi Denki Kabushiki Kaisha. Combustion device for a car. 4,547,147, Cl. 431-265.000.

Suzuki, Hiroyuki: *See*—
Uedaira, Satoru; Yamanoi, Hiroshi; Suzuki, Masayuki; Tamura, Hidemasa; and Suzuki, Hiroyuki, 4,547,355, Cl. 423-593.000.

Suzuki, Ichiro; Motonami, Masanao; Yamada, Makoto; and Yoshitsugu, Noritada, to Toyota Jidosha Kabushiki Kaisha. Guiding device for front seat belts. 4,546,998, Cl. 280-807.000.

Suzuki, Kenichi, to Oki Electric Industry Co., Ltd. Method of manufacturing semiconductor integrated circuit devices having dielectric isolation regions. 4,546,538, Cl. 29-576.00W.

Suzuki, Masayuki: *See*—
Uedaira, Satoru; Yamanoi, Hiroshi; Suzuki, Masayuki; Tamura, Hidemasa; and Suzuki, Hiroyuki, 4,547,355, Cl. 423-593.000.

Suzuki, Nobuhiko; and Sasaki, Masaya, to Diesel Kiki Co., Ltd. Energy-saving air conditioning system for vehicles. 4,546,617, Cl. 62-180.000.

Suzuki, Ryo: *See*—
Kodama, Naoki; Takeshita, Masatoshi; Suzuki, Ryo; Takeuchi, Teruaki; and Sugita, Yutaka, 4,547,865, Cl. 365-12.000.

Suzuki, Ryoichi; and Tokuda, Ryuji, to Canon Kabushiki Kaisha. Battery voltage checking apparatus. 4,547,770, Cl. 340-636.000.

Suzuki, Takeomi; Ishibashi, Kenzo; and Hashimoto, Isamu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Photosensor apparatus with light integration control. 4,547,676, Cl. 250-578.000.

Suzuki, Yasuro: *See*—
Tsuchimoto, Hiroshi; Suzuki, Yasuro; and Owada, Takeyoshi, 4,547,689, Cl. 310-71.000.

Suzuki, Yoichi: *See*—
Yuto, Masao; and Suzuki, Yoichi, 4,547,328, Cl. 264-45.900.

Svendsen, Find. Device for heating the bitumen layer of rolled roofing material. 4,547,152, Cl. 432-229.000.

Swanson, Wilbur M., to Dynatek, Inc. Accelerated heart valve testing apparatus and methods. 4,546,642, Cl. 73-37.000.

Swartz, Harold S. R.; and Arthurs, Trudy. Sportcycle. 4,546,992, Cl. 280-282.000.

Swarztrauber, Sayre A.: *See*—
Segan, Marc C.; Swarztrauber, Sayre A.; and Patterson, Neil K., 4,547,635, Cl. 200-52.00R.

Swiatosz, Edmund; and Grimmer, Paul D., to United States of America, Navy. Portable smoke generator. 4,547,656, Cl. 219-300.000.

Swift, Graham: *See*—
Hughes, Kathleen A.; and Swift, Graham, 4,547,556, Cl. 526-75.000.

Swinehart, Steven L., to Nisus Video Incorporated. Shutter for a video tape camera. 4,547,051, Cl. 352-216.000.

Sybert, Edward M.: *See*—
Milch, Robert A.; Guerry-Kopecko, Patricia; Koeble-Smith, Carol; and Sybert, Edward M., 4,547,226, Cl. 127-41.000.

Sylvernale, Ensi P.: *See*—
Levy-Navarro, Bernardo; and Sylvernale, Ensi P., 4,547,764, Cl. 340-347.0DD.

Symbex Corporation: *See*—
Proud, Ralph A., 4,546,542, Cl. 29-874.000.

Szayer, Geza J.: *See*—
Finch, Harry E.; and Szayer, Geza J., 4,546,590, Cl. 52-520.000.

Sze, Morgan C.; Bennett, Thomas M.; Simone, Andre A.; Ogren, Dennis F.; Nakaniwa, Mikio; and Furukawa, Kenji, to Lummus Crest, Inc.; and Maruzen Petrochemical Co., Ltd. Coke production. 4,547,284, Cl. 208-50.000.

Szechenyi, Kalman, to International Standard Electric Corporation. Method of and circuit for locating faults in a digital telecommunication subscriber termination. 4,547,633, Cl. 179-175.30F.

Szejtli, Jozsef: *See*—
Fenyvesi, Eva; Szejtli, Jozsef; Zsadon, Bela; Antal, Balazs; and Wagner nee Kohary, Ildiko , 4,547,572, Cl. 536-103.000.

Szymanski, Michael J.: *See*—
Weber, Harold J.; Kuehnle, Manfred R.; Compton, James C.; Poulakis, John N.; Szymanski, Michael J.; Lindblom, Kenneth A.; and Cleveland, Donald S., 4,547,061, Cl. 355-10.000.

Tabacek, Joseph A.: *See*—
Vogel, Roger F.; Rennard, Raymond J.; and Tabacek, Joseph A., 4,547,487, Cl. 502-351.000.

Tabak, Samuel A., to Mobil Oil Corporation. Reactor sequencing system for converting oxygenates to hydrocarbons. 4,547,602, Cl. 585-314.000.

Tabak, Samuel A., to Mobil Oil Corporation. Production of lubricant and/or heavy distillate range hydrocarbons by light olefin upgrading. 4,547,612, Cl. 585-533.000.

Tabak, Samuel A.: *See*—
Holland, Robert E.; and Tabak, Samuel A., 4,547,601, Cl. 585-310.000.

Tabata, Noboru: *See*—
Takeuchi, Itsuo; Yokoshima, Teruaki; Tabata, Noboru; Fujita, Eishin; Nagata, Koshiro; and Kishimoto, Tetsuya, 4,547,372, Cl. 426-11.000.

Tabe, Takayuki: *See*—
Ohno, Akira; Itakura, Yasushi; Tabe, Takayuki; and Hiromoto, Shuji, 4,546,958, Cl. 267-47.000.

Tabor, Edward; and Gerety, Robert J., to United States of America, Health and Human Services. Hepatitis B core antigen vaccine. 4,547,367, Cl. 424-89.000.

Tabor, Edward; and Gerety, Robert J., to United States of America, Health and Human Services. Hepatitis B core antigen vaccine made by recombinant DNA. 4,547,368, Cl. 424-89.000.

Taira, Akio: *See*—
Koike, Takaharu; and Taira, Akio, 4,547,047, Cl. 350-514.000.

Taiyo Yuden Co., Ltd.: *See*—
Masuyama, Masaru; Hirooka, Susumu; and Yamaoka, Nobutatsu, 4,547,314, Cl. 252-520.000.

Takada, Akira: *See*—
Ri, Masao; Ohhara, Kenji; Yamamoto, Yoshinori; Takada, Akira; Watanabe, Hisanori; and Osada, Yasuo, 4,547,823, Cl. 360-90.000.

Takada, Tadakazu; and Shimizu, Katsunori, to Fujitsu Limited. Process for fabricating a wiring layer of aluminum or aluminum alloy on semiconductor devices. 4,547,260, Cl. 156-643.000.

Takada, Takuzo, to Yoshino Kogyosho Co., Ltd. Apparatus for biaxial-blow-molding hollow bottle-shaped container of synthetic resin and method of biaxial-blow-molding the same container. 4,547,333, Cl. 264-532.000.

Takagi, Masashi: *See*—
Nishizawa, Kazutoshi; Takagi, Masashi; and Nishi, Yasuyuki, 4,547,133, Cl. 417-270.000.

Takahashi, Kenji: *See*—
Arakawa, Satoshi; and Takahashi, Kenji, 4,547,672, Cl. 250-483.100.

Takahashi, Masao: *See*—
Takeuchi, Fumio; Takahashi, Masao; and Sakai, Hiroshi, 4,547,234, Cl. 149-3.000.

Takahashi, Susumu: *See*—
Ueyanagi, Kiichi; Umemoto, Yasunari; Takahashi, Susumu; and Nakamura, Michiharu, 4,546,540, Cl. 29-579.000.

Takahashi, Toshio, to Fuji Jukogyo Kabushiki Kaisha. System for diagnosing an internal combustion engine. 4,546,645, Cl. 73-117.300.

Takahashi, Toshio, to Fuji Jukogyo Kabushiki Kaisha. System for diagnosing an internal combustion engine. 4,546,647, Cl. 73-118.000.

Takahashi, Yukio: *See*—
Tobita, Tomoyuki; Yamamoto, Yoshimi; Nagasu, Akira; and Takahashi, Yukio, 4,546,653, Cl. 73-720.000.

Takamiya, Sanshiro: *See*—
Suzuki, Akira; Oumi, Takeharu; Takamiya, Sanshiro; and Nakazawa, Hideo, 4,546,760, Cl. 128-1.00D.

Takano, Motoharu; Sugimura, Masaru; Kushima, Keiichi; and Ezaki, Atae, to Q. P. Corporation. Sterilizer. 4,547,343, Cl. 422-304.000.

Takasaki, Kunihiko, to Takigen Seizou Co., Ltd. Handle device for doors. 4,546,628, Cl. 70-92.000.

Takasaki, Kunuhiko, to Takigen Seizou Co., Ltd. Lock for refrigerator or the like which can be unlocked from inside thereof. 4,547,008, Cl. 292-341.150.

Takashima, Mitsuru: *See*—
Mori, Yoshihisa; and Takashima, Mitsuru, 4,547,874, Cl. 369-139.000.

Takata, Yoshinori: *See*—
Karasawa, Yoshiharu; and Takata, Yoshinori, 4,547,280, Cl. 204-403.000.

Takeda Chemical Industries, Ltd.: *See*—
Ogawa, Hiroe; and Imamura, Yoshisuke, 4,547,377, Cl. 426-268.000.
Takeda, Hirro, to Nippon Oil Co., Ltd. Method of heat-treating particles and apparatus therefor. 4,547,151, Cl. 432-14.000.
Takeda, Koichiro, to Fujitsu Limited. Phase lock loop PSK demodulator with sweep control circuit. 4,547,736, Cl. 329-50.000.
Takeda, Yasuyuki: *See*—
Kasuga, Takuzo; Asano, Takeshi; Ikenaga, Yukio; Yamawaki, Masami; Takeda, Yasuyuki; and Ichimura, Koichi, 4,547,565, Cl. 528-232.000.
Takefuta, Hideyasu: *See*—
Moriya, Kouichi; Iwata, Kouki; and Takefuta, Hideyasu, 4,546,736, Cl. 123-179.00G.
Takemura, Michio: *See*—
Okada, Tokio; Makino, Tsutomu; and Takemura, Michio, 4,546,675, Cl. 81-9.510.
Takeshita, Masatoshi: *See*—
Kodama, Naoki; Takeshita, Masatoshi; Suzuki, Ryo; Takeuchi, Teruaki; and Sugita, Yutaka, 4,547,865, Cl. 365-12.000.
Takeuchi, Fumio; Takahashi, Masao; and Sakai, Hiroshi, to Nippon Oil and Fats Company Limited. Explosive composition. 4,547,234, Cl. 149-3.000.
Takeuchi, Itsuo; Yokoshima, Teruaki; Tabata, Noboru; Fujita, Eishin; Nagata, Koshiro; and Kishimoto, Tetsuya, to Kikkoman Corporation; and Nado-Gogo Sake Brewers Common Facility Corporation. Method for brewing Sake . 4,547,372, Cl. 426-11.000.
Takeuchi, Teruaki: *See*—
Kodama, Naoki; Takeshita, Masatoshi; Suzuki, Ryo; Takeuchi, Teruaki; and Sugita, Yutaka, 4,547,865, Cl. 365-12.000.
Takeuchi, Tomio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Tanaka, Wataru; Takita, Tomohisa; Nishimura, Yoshio; and Yoshikawa, Hiroshi, 4,547,567, Cl. 536-17.200.
Takigen Seizou Co., Ltd.: *See*—
Takasaki, Kunihiko, 4,546,628, Cl. 70-92.000.
Takasaki, Kunuhiko, 4,547,008, Cl. 292-341.150.
Takita, Tomohisa: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Tanaka, Wataru; Takita, Tomohisa; Nishimura, Yoshio; and Yoshikawa, Hiroshi, 4,547,567. Cl. 536-17.200.
Talley, John J.: *See*—
Mendiratta, Ashok K.; and Talley, John J., 4,547,596, Cl. 568-751.000.
Tam, Wai-Ming, to Perkin-Elmer Corporation, The. Motion measurement and alignment method and apparatus. 4,547,446, Cl. 430-22.000.
Tamai, Kenzo; Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Tsuda, Hisatsugu; Sakai, Hiroshi; Sugita, Masatoshi; Yamamoto, Yoshiko; Minami, Hisashi; and Hori, Takako, to Toyama Chemical Co., Ltd. Process for preparing substance having carcinostatic and immunostimulating activity. 4,547,462, Cl. 435-72.000.
Tamura, Hidemasa: *See*—
Uedaira, Satoru; Yamanoi, Hiroshi; Suzuki, Masayuki; Tamura, Hidemasa; and Suzuki, Hiroyuki, 4,547,355, Cl. 423-593.000.
Tamura, Masami, to Nippondenso Co., Ltd. Heat exchanger with adhesive seals. 4,546,822, Cl. 165-149.000.
Tamura, Mitsuhisa: *See*—
Suzukamo, Gohfu; Tamura, Mitsuhisa; and Fukao, Masami, 4,547,586, Cl. 560-211.000.
Tamura, Yasuyuki; Nakaoka, Masaki; Miyagi, Ken; Nogashima, Nao; Sue, Yasuhiko; Suda, Masashi; and Ariga, Masao, to Canon Kabushiki Kaisha. Data transmission system. 4,547,628, Cl. 178-2.00B.
Tamura, Yasuyuki: *See*—
Kaneko, Shuzo; and Tamura, Yasuyuki, 4,547,787, Cl. 346-160.000.
Tanabe Seiyaku Co., Ltd.: *See*—
Oine, Toyonari; Yamada, Yoshihisa; Wagatsuma, Mitsuyoshi; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,547,494, Cl. 514-204.000.
Tanabe, Zenichi: *See*—
Ohashi, Azusa; Sakaki, Hirokazu; Nakanishi, Haruo; Tanabe, Zenichi; Tsuchida, Shin; and Hayashi, Yoshikatsu, 4,547,274, Cl. 204-129.400.
Tanaka, Hiroshi: *See*—
Kumazawa, Toshiaki; Oiji, Yoshimasa; Tanaka, Hiroshi; and Shuto, Katsuichi, 4,547,496, Cl. 514-218.000.
Tanaka, Katsuhiko; and Sakatani, Ikunori, to Nippon Seiko Kabushiki Kaisha. Dynamic pressure type fluid bearing. 4,547,081, Cl. 384-107.000.
Tanaka, Kunihiro; and Futagami, Nobuhiro, to Kawasaki Steel Corp. Ignition device for sintering machine. 4,547,146, Cl. 431-180.000.
Tanaka, Wataru: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Tanaka, Wataru; Takita, Tomohisa; Nishimura, Yoshio; and Yoshikawa, Hiroshi, 4,547,567, Cl. 536-17.200.
Tanaka, Yoshiaki; Inami, Mamoru; and Otsuki, Zenju, to Victor Company of Japan, Limited. Apparatus for displaying musical notes indicative of pitch and time value. 4,546,690, Cl. 84-477.00R.
Tanase, Teruyoshi; Nishigaki, Kenichi; and Ajima, Tatsuro, to Mitsubishi Kinzoku Kabushiki Kaisha. Sialon-base ceramic materials excellent in wear resistance. 4,547,470, Cl. 501-87.000.
Tandberg Data A/S: *See*—
Lia, Herman, 4,547,818, Cl. 360-46.000.
Tanei, Hirayoshi: *See*—
Tosaki, Hiromi; Tanei, Hirayoshi; Ikegami, Akira; and Sugishita, Nobuyuki, 4,547,625, Cl. 174-68.500.
Tang, Ching-Chiang, to Amdahl Corporation. Reusable fixture for holding a segment of a flexible strip. 4,547,794, Cl. 357-70.000.
Tangorra, Giorgio; Robecchi, Edoardo; and Magnabosco, Lino, to Industrie Pirelli S.p.A. Transmission joint. 4,547,175, Cl. 464-56.000.
Tani, Hirozi: *See*—
Kasanami, Tohru; Tani, Hirozi; and Yokoi, Tsutomu, 4,547,310, Cl. 252-511.000.
Tanigaki, Shuzo; Yasuda, Tomio; and Sakaki, Masayuki, to Kabushiki Kaisha Meidensha. Vacuum monitor device and method for vacuum interrupter. 4,547,769, Cl. 340-626.000.
Tanner Chaplin Tracks Ltd.: *See*—
Tanner, Peter R.; and Chaplin, Eric, 4,547,030, Cl. 339-21.00R.
Tanner, Peter R.; and Chaplin, Eric, to Tanner Chaplin Tracks Ltd. Electrical distribution system. 4,547,030, Cl. 339-21.00R.
Tanner, Robert M., to Leland Stanford Jr. University, The Board of Trustees of The. Error detecting and correcting memories. 4,547,882, Cl. 371-38.000.
Tanno, Satoru, to Showa Manufacturing Co., Ltd. Shock absorber having adjustable damping means including an auxiliary oil tank. 4,546,959, Cl. 267-64.150.
Tasma, Gerald W. Tamperproof packaging. 4,546,881, Cl. 206-459.000.
Tateishi, Terutaka: *See*—
Nishida, Hidehiko; Koshino, Minoru; Tateishi, Terutaka; and Hattori, Akira, 4,547,848, Cl. 364-200.000.
Taylor, Jake E. Universal trailer hitch. 4,546,994, Cl. 280-423.00R.
Taylor, Lloyd D.: *See*—
Jasne, Stanley J.; Schwarzel, William C.; Sullivan, Charles I.; and Taylor, Lloyd D., 4,547,451, Cl. 430-215.000.
Taylor, Robert F. Orthodontic appliance. 4,547,153, Cl. 433-11.000.
Taylor, Robert R. Valved access fitting. 4,546,789, Cl. 137-245.500.
Taylor, Robert R.; Bowen, Billy C.; and Emery, John H., to Bell Helicopter Textron Inc. IR Light for use with night vision goggles. 4,547,701, Cl. 313-500.000.
Tchorbajian, Nichan: *See*—
Bellin, Howard T.; Fellner, Donald; and Tchorbajian, Nichan, 4,546,776, Cl. 128-704.000.
TDK Corporation: *See*—
Hirayama, Hiromitsu; and Ebina, Hisashi, 4,547,705, Cl. 315-219.000.
Nishimatsu, Masaharu; Ide, Toshiaki; Arioka, Hiroyuki; and Kubota, Yuichi, 4,547,419, Cl. 428-212.000.
Okamura, Masatoshi; and Ishida, Toshihiko, 4,546,936, Cl. 242-198.000.
Teche, Andre : *See*—
Martel, Jacques; Tessier, Jean; and Teche, Andre , 4,547,522, Cl. 514-531.000.
Technicare Corporation: *See*—
Richey, Joseph B.; Wake, Robert H.; Walters, Ronald G.; Hunt, Willard F.; and Cool, Steven L., 4,547,892, Cl. 378-8.000.
Tecnomare S.p.A.: *See*—
Macchi, Carla; and Nicolussi, Franco, 4,547,095, Cl. 405-206.000.
Tecstor, Inc.: *See*—
Brown, Stewart C., 4,547,822, Cl. 360-78.000.
Tegal Corporation: *See*—
Lachenbruch, Roger B.; and Zajac, John P., 4,547,248, Cl. 156-345.000.
Warenback, Douglas H.; Rathmann, Thomas M.; and Mirkovich, Ninko T., 4,547,247, Cl. 156-345.000.
Teitelbaum, Heshel, to Canadian Patents and Development Limited. Method and apparatus for measuring density gradient. 4,547,071, Cl. 356-344.000.
Tektronix, Inc.: *See*—
Beazley, Todd M.; and Diller, Calvin D., 4,547,724, Cl. 324-57.00R.
Rath, Dale R., 4,547,695, Cl. 313-406.000.
Teledyne Industries Inc.: *See*—
Cummins, William T.; and Lobdell, Wallace A., 4,546,807, Cl. 152-41.000.
Teleflex Incorporated: *See*—
Carlson, John A., 4,547,239, Cl. 156-73.500.
Telefonaktiebolaget LM Ericsson: *See*—
Nilsson, Kurt A. I., 4,547,740, Cl. 330-2.000.
Templeton, James H.: *See*—
Brennan, Michael E.; Templeton, James H.; and Yeakey, Ernest L., 4,547,591, Cl. 564-479.000.
Tengler, John: *See*—
Morgan, Thomas E.; and Tengler, John, 4,547,028, Cl. 339-14.00R.
Teramachi, Hiroshi. Cross-linear slide bearing having reduced thickness for use in X-Y table. 4,547,024, Cl. 308-6.00C.
Terano, Minoru; Soga, Hirokazu; Inoue, Masuo; and Miyoshi, Katsuyoshi, to Toho Titanium Co., Ltd. Catalyst component for the polymerization of olefins and catalyst therefor. 4,547,476, Cl. 502-127.000.
Teratani, Tatsuo; and Kodera, Masao, to Toyota Jidosha Kabushiki Kaisha; and Nippon Soken, Inc. High frequency current inducing apparatus. 4,547,731, Cl. 324-58.00R.
Terauchi, Kiyoshi; and Hiraga, Masaharu, to Sanden Corporation. Scroll type fluid compressor with thickened spiral elements. 4,547,137, Cl. 418-55.000.
Terra Tek, Inc.: *See*—
Jones, Arfon H.; and Cutler, Raymond A., 4,547,468, Cl. 501-33.000.
Terry, David E.; and Christian, Donald K. Coin insert for vending machine. 4,546,867, Cl. 194-1.00D.
Terumo Kabushiki Kaisha: *See*—
Ichikawa, Toshiji; Ohhachi, Yoshinori; and Kanda, Zensho, 4,547,191, Cl. 604-251.000.

Tessier, Jean: *See*—
Martel, Jacques; Tessier, Jean; and Teche, Andre , 4,547,522, Cl. 514-531.000.
Tetra Pak Developement S.A.: *See*—
Reil, Wilhelm, 4,546,592, Cl. 53-373.000.
Tetsutani, Nobuji: *See*—
Ochi, Hiroshi; and Tetsutani, Nobuji, 4,547,811, Cl. 358-280.000.
Teutsch, Jean-Georges; Torelli, Vesperto; Deraedt, Roger; and Philibert, Daniel, to Roussel Uclaf. Novel 11β-substituted-19-nor-steroids. 4,547,493, Cl. 514-179.000.
Tewari, Krishna C.; and Foster, Edward P., to International Coal Refining Co. SRC Residual fuel oils. 4,547,201, Cl. 44-51.000.
Texaco Development Corporation: *See*—
Jahnke, Frederick C., 4,547,145, Cl. 431-76.000.
Jahnke, Frederick C., 4,547,203, Cl. 48-197.00R.
Texaco Inc.: *See*—
Brennan, Michael E.; Templeton, James H.; and Yeakey, Ernest L., 4,547,591, Cl. 564-479.000.
Long, Stephen L.; Cheung, Yin L.; and Brown, Alfred, 4,547,078, Cl. 374-42.000.
McEntire, Edward E.; Neville, Gordon H.; and Nieh, Edward C. Y., 4,547,304, Cl. 252-79.100.
Sanderson, John R.; Keating, Kenneth P.; Marquis, Edward T.; and Vanderpool, Steven H., 4,547,598, Cl. 568-922.000.
Texas Alkyls, Inc.: *See*—
Malpass, Dennis B.; and Webb, Dale W., 4,547,477, Cl. 502-153.000.
Texas Instruments Incorporated: *See*—
Childers, Jimmie D.; and Hyslop, Adin E., 4,547,868, Cl. 365-203.000.
Hinkle, Robert W.; and O'Hagan, Michael, 4,547,778, Cl. 343-456.000.
Witter, David E.; and Bawa, Mohendra S., 4,547,258, Cl. 156-605.000.
Texasgulf Inc.: *See*—
Carr, Jesse M., Jr.; Sheler, Raymond E.; Richards, Frank J.; and Kelder, Eric, 4,547,295, Cl. 210-777.000.
Thaler, Warren A.: *See*—
Lundberg, Robert D.; and Thaler, Warren A., 4,547,542, Cl. 324-211.000.
Thebault, Claude, to KIS France. Device for simultaneously printing and developing photographs. 4,547,065, Cl. 355-28.000.
Thermacore, Inc.: *See*—
Eastman, George Y., 4,547,130, Cl. 417-53.000.
Thiemer, Klaus: *See*—
Oepen, Gerhard; Engel, Jurgen; Jakovlev, Vladimir; and Thiemer, Klaus, 4,547,505, Cl. 514-255.000.
Thomas R. Kelly, M.D., Inc.: *See*—
Kelly, Thomas R., 4,547,187, Cl. 604-49.000.
Thomas, Terence M.: *See*—
Pitts, John R.; Thomas, Terence M.; and Czanderna, Alvin W., 4,547,432, Cl. 428-448.000.
Thomassen, Hans R.: *See*—
Pedersen, Jack R.; Thomassen, Hans R.; and Henriksen, Svein, 4,547,626, Cl. 174-107.000.
Thometz, Steve P. Multi-colored airbrush attachment system having a spiral mixing chamber and a wrist/arm-mounted paint reservoir. 4,546,922, Cl. 239-304.000.
Thompson, Farish R. Charge placement device. 4,546,703, Cl. 102-333.000.
Thompson, Joseph V., Jr., to E-Zee Company. Non-tangling trot-line spooling apparatus. 4,546,569, Cl. 43-57.300.
Thompson, Kevan R.: *See*—
Doherty, James B.; Ashe, Bonnie M.; Finke, Paul E.; Shah, Shrenik K.; Thompson, Kevan R.; and Zimmerman, Morris, 4,547,371, Cl. 514-200.000.
Thompson, Leonard R.: *See*—
Louks, David H.; Thompson, Leonard R.; and Muench, Wayne C., 4,547,597, Cl. 568-779.000.
Thomson-CSF: *See*—
Arditty, Herve ; and Graindorge, Philippe, 4,547,650, Cl. 219-121.0LE.
Dumont, Bernard; Proponet, Christian; Bancelin, Bernard; Brucker, Roland; Bories, Jean-Louis; and Klein, Christiane, 4,547,834, Cl. 361-386.000.
Maerfeld, Charles; Josserand, Michel; and Gragnolati, Claude, 4,547,870, Cl. 367-155.000.
Thoraval, Yvon, to Schlumberger Technology Corporation. Amplitude and phase measurement in electromagnetic logging. 4,547,733, Cl. 324-338.000.
Thorne, William D.; and Sedgwick, David M., to International Business Machines Corporation. Printer having drive and control system for metal band holding print elements. 4,546,699, Cl. 101-93.140.
Thun, Niels: *See*—
Beierholm, Hans M.; and Thun, Niels, 4,547,842, Cl. 363-35.000.
Tiburtius, Christoph: *See*—
Zabrocki, Karl; Tiburtius, Christoph; Doring, Joachim; and Richter, Klaus, 4,547,533, Cl. 523-206.000.
Tiegel Manufacturing Company: *See*—
Tiegel, Ralph G., 4,546,812, Cl. 164-130.000.
Tiegel, Ralph G., to Tiegel Manufacturing Company. Method and apparatus for improving the densities of cast parts. 4,546,812, Cl. 164-130.000.
Tillman, James J.: *See*—
Burzynski, Alfred J.; and Tillman, James J., 4,547,397, Cl. 427-164.000.
Tinder, David V., to United Technologies Automotive, Inc. Lamp holder for mounting a lamp on a circuit board. 4,547,840, Cl. 362-226.000.
Tinios, Pantelis G.: *See*—
Husson, Alan L.; and Tinios, Pantelis G., 4,547,732, Cl. 324-166.000.
Tjoeng, Foe-Siong: *See*—
Goldstein, Gideon; Heavner, George; Audhya, Tapan; and Tjoeng, Foe-Siong, 4,547,489, Cl. 514-11.000.
Tobita, Tomoyuki; Yamamoto, Yoshimi; Nagasu, Akira; and Takahashi, Yukio, to Hitachi, Ltd. Semiconductor differential pressure transducer. 4,546,653, Cl. 73-720.000.
Tobler, Werner, to Novoflex Fotogeratebau Karl Muller, Firma. Bellows assembly for photographic cameras. 4,547,053, Cl. 354-187.000.
Toda, Akitoshi; and Mimura, Yoshiyuki, to Olympus Optical Co., Ltd. Developing apparatus for electrophotographic copying machines. 4,546,722, Cl. 118-657.000.
Todt, Klaus H.; and Castenmiller, Wilhelmus A. M., to Lever Brothers Company. Edible emulsions containing Amadori rearrangement products. 4,547,387, Cl. 426-602.000.
Tohda, Takao: *See*—
Fujita, Yosuke; Tohda, Takao; Matsuoka, Tomizo; Abe, Atsushi; and Nitta, Tsuneharu, 4,547,703, Cl. 313-509.000.
Toho Titanium Co., Ltd.: *See*—
Terano, Minoru; Soga, Hirokazu; Inoue, Masuo; and Miyoshi, Katsuyoshi, 4,547,476, Cl. 502-127.000.
Tokico, Ltd.: *See*—
Kiryu, Kyuji; and Aizawa, Kensuke, 4,546,724, Cl. 118-669.000.
Tokuda, Ryuji: *See*—
Suzuki, Ryoichi; and Tokuda, Ryuji, 4,547,770, Cl. 340-636.000.
Tokyo Electric Co., Ltd.: *See*—
Ochiai, Kuniaki; Norigoe, Takashi; and Iinuma, Masayuki, 4,547,085, Cl. 400-124.000.
Saito, Shunji, 4,547,820, Cl. 360-71.000.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Sasaki, Tsuneo; Ohtomo, Fumio; Yokokura, Takashi; and Kondo, Fumitomo, 4,547,667, Cl. 250-231.0SE.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Egawa, Hideharu, 4,547,681, Cl. 307-279.000.
Egawa, Hideharu, 4,547,790, Cl. 357-42.000.
Goto, Kuniaki, 4,547,743, Cl. 330-254.000.
Ichikawa, Kentaro, 4,547,123, Cl. 415-24.000.
Mori, Masafumi, 4,547,038, Cl. 350-6.500.
Nagasaka, Syuichi; and Kaneko, Siyoukichi, 4,546,726, Cl. 118-719.000.
Ohtombe, Ko; Ishida, Tsuyoshi; Osawa, Hideo; and Nagahashi, Kenji, 4,547,896, Cl. 382-7.000.
Okada, Tokio; Makino, Tsutomu; and Takemura, Michio, 4,546,675, Cl. 81-9.510.
Ono, Masahiko, 4,547,762, Cl. 340-347.0DA.
Shibata, Toshio; and Sakuma, Koichiro, 4,547,901, Cl. 455-300.000.
Shinbara, Seitaro, 4,547,752, Cl. 332-31.00T.
Sugimoto, Hiroshi; and Naruse, Yujiro, 4,547,670, Cl. 250-370.000.
Torizuka, Hideki; Soejima, Tomohide; and Hori, Shigekazu, 4,547,750, Cl. 331-99.000.
Tsuaki, Hajime, 4,546,916, Cl. 236-44.00A.
Tolbert, Thomas W.: *See*—
Kutnyak, Thomas A.; and Tolbert, Thomas W., 4,547,029, Cl. 339-16.00R.
Tomahawk Industries, Inc.: *See*—
McDaniel, Thomas I., 4,547,013, Cl. 296-1.00S.
Tomita, Sadami: *See*—
Watanabe, Ryuji; Iwashita, Kiyoji; Tomita, Sadami; Kuniya, Keiichi; and Tsuda, Hideaki, 4,547,639, Cl. 200-144.00B.
Tomita, Satoru: *See*—
Nagayama, Haruhiko; and Tomita, Satoru, 4,547,059, Cl. 355-3.0BE.
Tomori, Katsuhiko: *See*—
Hashimoto, Hideo; Tomori, Katsuhiko; and Sano, Yuji, 4,547,854, Cl. 364-474.000.
Tompkins, David E.: *See*—
Beny, Janos; and Tompkins, David E., 4,546,644, Cl. 73-65.000.
Tone, Junsuke: *See*—
Celmer, Walter D.; Cullen, Walter P.; Maeda, Hiroshi; and Tone, Junsuke, 4,547,523, Cl. 514-375.000.
Toohey, William J.: *See*—
Franco-Ferreira, Edgard A.; and Toohey, William J., 4,547,653, Cl. 219-124.340.
Toratani, Hisayoshi: *See*—
Nakajima, Sadahiro; Kanamori, Chiemi; and Toratani, Hisayoshi, 4,547,402, Cl. 427-169.000.
Toray Industries, Inc.: *See*—
Hiramoto, Hiroo; and Eguchi, Masuichi, 4,547,455, Cl. 430-325.000.
Torborg, Ralph H.: *See*—
Dietiker, Paul; Olson, Elwyn H.; and Torborg, Ralph H., 4,547,144, Cl. 431-20.000.
Torchet, Bernard: *See*—
Delmulle, Jean P.; and Torchet, Bernard, 4,546,645, Cl. 73-74.000.
Torelli, Vesperto: *See*—
Teutsch, Jean-Georges; Torelli, Vesperto; Deraedt, Roger; and Philibert, Daniel, 4,547,493, Cl. 514-179.000.
Torenbeek, Reinder, to Akzo N.V. Aqueous emulsion of tertiary butyl hydroperoxide. 4,547,308, Cl. 252-186.260.
Torgersen, Robert H., to Automation Industries, Inc. Sonic water jet nozzle. 4,546,920, Cl. 239-102.000.

Torizuka, Hideki; Soejima, Tomohide; and Hori, Shigekazu, to Tokyo Shibaura Denki Kabushiki Kaisha. FET Oscillator exhibiting negative resistance due to high impedance at the source of an FET thereof. 4,547,750, Cl. 331-99.000.

Tosaki, Hiromi; Tanei, Hirayoshi; Ikegami, Akira; and Sugishita, Nobuyuki, to Hitachi, Ltd. Glass multilayer wiring board and method for its manufacture. 4,547,625, Cl. 174-68.500.

Totsuka, Mikio: *See*—
Maeda, Minoru; Iwasaki, Masayuki; Inoue, Noriyuki; and Totsuka, Mikio, 4,547,450, Cl. 430-202.000.

Tower, Steven A.; and Greenspan, Jay S., to Isotronics, Inc. Method and apparatus for reducing package height for microcircuit packages. 4,547,624, Cl. 174-52.0FP.

Towle, Alan L.; and Towle, Milton A., to Sure Stop Manufacturing, Inc. Target for projectiles. 4,546,984, Cl. 273-404.000.

Towle, Milton A.: *See*—
Towle, Alan L.; and Towle, Milton A., 4,546,984, Cl. 273-404.000.

Toya, Ichizo, to Fuji Photo Film Co., Ltd. Color diffusion transfer photographic element with sufinic acid. 4,547,452, Cl. 430-216.000.

Toyama Chemical Co., Ltd.: *See*—
Tamai, Kenzo; Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Tsuda, Hisatsugu; Sakai, Hiroshi; Sugita, Masatoshi; Yamamoto, Yoshiko; Minami, Hisashi; and Hori, Takako, 4,547,462, Cl. 435-72.000.

Toyo Contact Lens Co., Ltd.: *See*—
Shibata, Takanori; Yamanaka, Masashige; and Kako, Hiroyuki, 4,547,543, Cl. 524-264.000.

Toyokuni, Kazuo: *See*—
Yukishige, Yoshifumi; Toyokuni, Kazuo; and Kuroiwa, Yoshizo, 4,546,840, Cl. 180-169.000.

Toyota, Akinori; and Kashiwa, Norio, to Mitsui Petrochemical Industries, Ltd. Process for producing a chemically blended propylene polymer composition and the composition produced by said process. 4,547,552, Cl. 525-247.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Igashira, Toshihiko; Sakakibara, Yasuyuki; Abe, Seiko; Koide, Hiroshi; and Shinoda, Kazuo, 4,546,749, Cl. 123-506.000.
Mae, Hisao; and Miyauchi, Kazuo, 4,546,732, Cl. 123-1.00A.
Shigematsu, Takashi; and Watanabe, Tomoyuki, 4,546,673, Cl. 74-866.000.
Suzuki, Ichiro; Motonami, Masanao; Yamada, Makoto; and Yoshitsugu, Noritada, 4,546,998, Cl. 280-807.000.
Teratani, Tatsuo; and Kodera, Masao, 4,547,731, Cl. 324-58.00R.

Toyota Motor Corporation: *See*—
Kazuoka, Koji; Suganuma, Testuya; Motooka, Naoki; and Kuroishi, Nobuhito, 4,546,737, Cl. 123-188.00S.

Tremblay, Richard P., to Kerotest Manufacturing Corp. Actuator mechanism for double bent bellows sealed rotary valve. 4,546,662, Cl. 74-18.100.

Troutman, Bruce L.: *See*—
McIver, George W.; Whalen, Barry H.; and Troutman, Bruce L., 4,547,862, Cl. 364-726.000.

TRW Inc.: *See*—
McIver, George W.; Whalen, Barry H.; and Troutman, Bruce L., 4,547,862, Cl. 364-726.000.

Trybulski, Eugene J.: *See*—
Fryer, Rodney I.; Gilman, Norman W.; Trybulski, Eugene J.; and Walser, Armin, 4,547,581, Cl. 549-451.000.

Tsang, Ching H.: *See*—
Best, John S.; Lee, Kenneth; and Tsang, Ching H., 4,547,824, Cl. 360-113.000.

Tsang, Paul J.: *See*—
Anantha, Narasipur G.; Riseman, Jacob; and Tsang, Paul J., 4,546,536, Cl. 29-571.000.

Tsikos, Constantine, to Siemens Corporate Research & Support, Inc. Two-dimensional pressure sensor using retro-reflective tape and semi-transparent medium. 4,547,668, Cl. 250-231.00P.

Tsikos, Constantine J., to Siemens Corporate Research & Support, Inc. Apparatus for determining the two-dimensional connectivity of a prescribed binary variable associated with a surface. 4,547,898, Cl. 382-4.000.

Tsuaki, Hajime, to Tokyo Shibaura Denki Kabushiki Kaisha. Humidifier. 4,546,916, Cl. 236-44.00A.

Tsuchida, Shin: *See*—
Ohashi, Azusa; Sakaki, Hirokazu; Nakanishi, Haruo; Tanabe, Zenichi; Tsuchida, Shin; and Hayashi, Yoshikatsu, 4,547,274, Cl. 204-129.400.

Tsuchimoto, Hiroshi; Suzuki, Yasuro; and Owada, Takeyoshi, to Hitachi, Ltd. Rotary electric machine operable with changeable rated voltage. 4,547,689, Cl. 310-71.000.

Tsuchiya, Tsutomu: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Yoneta, Toshio; and Fukatsu, Shunzo, 4,547,492, Cl. 514-41.000.

Tsuda, Hideaki: *See*—
Watanabe, Ryuji; Iwashita, Kiyoji; Tomita, Sadami; Kuniya, Keiichi; and Tsuda, Hideaki, 4,547,639, Cl. 200-144.00B.

Tsuda, Hisatsugu: *See*—
Tamai, Kenzo; Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Tsuda, Hisatsugu; Sakai, Hiroshi; Sugita, Masatoshi; Yamamoto, Yoshiko; Minami, Hisashi; and Hori, Takako, 4,547,462, Cl. 435-72.000.

Tsui, James B. Y.; and Shaw, Rudy L., to United States of America, Air Force. Simultaneous signal detection for IFM receivers by transient detection. 4,547,727, Cl. 324-79.00D.

Tsuno, Koichi: *See*—
Yoshida, Kenichi; Yokohara, Takashi; Ono, Kimizo; Nishiwaki, Yoshikazu; and Tsuno, Koichi, 4,547,072, Cl. 356-350.000.

Tsuyuki, Yasuo: *See*—
Kobayashi, Michio; and Tsuyuki, Yasuo, 4,546,691, Cl. 91-376.00R.

Tungate, Freddie L.: *See*—
Bennett, James G., Jr.; and Tungate, Freddie L., 4,547,480, Cl. 502-159.000.

Turanchik, Michael F.; Yeung, Kwok K.; and Smith, Nathan L., to Allied Corporation. Detecting rheumatoid factor with synthetic particles having immune complexes thereon. 4,547,466, Cl. 436-509.000.

Turnbull, Lennox B.; Donohue, John A.; and Jagdmann, Gunnar E., Jr., to A. H. Robins Company, Incorporated. Antiemetic N-(1-substituted-4,5-dihydro-1H-pyrazol-4-yl)benzamides. 4,547,518, Cl. 514-403.000.

Turner, Herman E., Jr.; and Shanaberger, Jan L., to Nordson Corporation. Manipulator robot. 4,547,120, Cl. 414-744.00R.

Tusinski, Joseph; Hill, Phillip D.; and Griffith, John M., to Coburn Optical Industries, Inc. Autoclave for bonding composite lenses. 4,547,242, Cl. 156-105.000.

Tutino, Dominick J. Cleaning pad holder. 4,546,514, Cl. 15-209.00D.

TVI Energy Corporation: *See*—
Rosa, Stephen P., 4,546,983, Cl. 273-348.100.

Tzikas, Athanassios, to Ciba-Geigy Corporation. Vat dyes obtainable by bromination of dibenzanthrone and reaction with 1-aminoanthraquinone. 4,547,575, Cl. 546-30.000.

Uchida, Kenji; Sakamoto, Masakatsu; Saito, Makoto; Kamino, Yukishige; and Miyadera, Hiroshi, to Hitachi, Ltd. Apparatus for continuously transferring a slurry by liquid pressure. 4,547,132, Cl. 417-63.000.

Uchiyama, Tsugio: *See*—
Kaneko, Kimiyoshi; Ishikawa, Hiromichi; Moriyama, Satoru; and Uchiyama, Tsugio, 4,547,524, Cl. 514-594.000.

Ueda, Hideaki, to Minolta Camera Kabushiki Kaisha. Photosensitive members for electrophotography containing phthalocyanine. 4,547,447, Cl. 430-78.000.

Uedaira, Satoru; Yamanoi, Hiroshi; Suzuki, Masayuki; Tamura, Hidemasa; and Suzuki, Hiroyuki, to Sony Corporation. Method for manufacturing fine powder of $SrZrO_3$. 4,547,355, Cl. 423-593.000.

Ueno, Kazunori; and Suizu, Yohji, to Bridgestone Tire Co., Ltd. Heat insulation structure for rooftops of buildings. 4,546,580, Cl. 52-126.100.

Ueno, Yauso. Kinematic universal coupling. 4,547,177, Cl. 464-69.000.

Ueyanagi, Kiichi; Umemoto, Yasunari; Takahashi, Susumu; and Nakamura, Michiharu, to Hitachi, Ltd. Self-aligned manufacture of FET. 4,546,540, Cl. 29-579.000.

Umeda, Fumio: *See*—
Nakatomi, Yasuo; Saito, Hiraku; Nagashima, Akihiro; and Umeda, Fumio, 4,547,374, Cl. 426-19.000.

Umemoto, Yasunari: *See*—
Ueyanagi, Kiichi; Umemoto, Yasunari; Takahashi, Susumu; and Nakamura, Michiharu, 4,546,540, Cl. 29-579.000.

Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Yoneta, Toshio; and Fukatsu, Shunzo, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. 1-N-(ω-Amino-α-hydroxyalkanoyl-2',3'-dideoxykanamycin A and pharmaceutical composition containing same. 4,547,492, Cl. 514-41.000.

Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Tanaka, Wataru; Takita, Tomohisa; Nishimura, Yoshio; and Yoshikawa, Hiroshi, to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai. Derivatives of 4'-demethyl-4-epipodophyllotoxin. 4,547,567, Cl. 536-17.200.

Umezawa, Sumio: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Yoneta, Toshio; and Fukatsu, Shunzo, 4,547,492, Cl. 514-41.000.

Unger, Gregor: *See*—
Raisig, Hermann; Unger, Gregor; and Wirbser, Oscar, 4,547,652, Cl. 219-121.0LD.

Unimation, Inc.: *See*—
Masaki, Ichiro, 4,547,800, Cl. 358-107.000.

Union Carbide Corporation: *See*—
Lustig, Stanley; Schuetz, Jeffrey M.; and Vicik, Stephen J., 4,547,413, Cl. 428-35.000.
Weiler, David W., 4,547,326, Cl. 261-114.00R.

Union Oil Company of California: *See*—
Miller, Robert E., 4,547,285, Cl. 208-89.000.

Unique Energy Systems, Inc.: *See*—
Papineau, Ronald I., 4,547,356, Cl. 423-658.000.

Uniroyal, Inc.: *See*—
Worns, John R.; Chase, James W.; and Capriotti, Bruce W., 4,547,453, Cl. 430-271.000.

United Kingdom Atomic Energy Authority: *See*—
Hooper, Alan; and North, John M., 4,547,440, Cl. 429-112.000.

U.S. Balloon Mfg. Co., Inc.: *See*—
Blacksberg, Richard; and Isaacs, Michael S., 4,547,168, Cl. 446-222.000.

U.S. Banknote Corporation: *See*—
Colgate, Gilbert, Jr., 4,547,002, Cl. 283-91.000.

United States Forgecraft Corporation: *See*—
Bailey, James T., Jr., 4,546,523, Cl. 24-241.0PP.

United States of America
Air Force: *See*—
Hawrylo, Frank Z., 4,547,230, Cl. 148-171.000.
Jones, Nelson E., 4,547,884, Cl. 372-58.000.
Maloy, Joseph T.; Leonard, John F.; and Fritts, David H., 4,546,897, Cl. 220-277.000.

Reinhardt, Bruce A.; Arnold, Fred E.; and Unroe, Marilyn R., 4,547,592, Cl. 568-33.000.
Tsui, James B. Y.; and Shaw, Rudy L., 4,547,727, Cl. 324-79.00D.
Army: *See—*
Ballato, Arthur, 4,547,748, Cl. 331-49.000.
Cadieu, Fred J., 4,547,276, Cl. 204-192.00M.
Mui, Shou Y., 4,547,887, Cl. 375-1.000.
Energy: *See—*
Biermann, Wendell J., 4,546,620, Cl. 62-476.000.
Brogli, Rudolf H.; Shamasunder, Bangalore I.; and Seth, Shivaji S., 4,547,334, Cl. 376-389.000.
Downs, Robert E.; and Schwallie, Ambrose L., 4,547,335, Cl. 376-442.000.
Dunn, James C.; Hardee, Harry C.; and Striker, Richard P., 4,547,080, Cl. 374-135.000.
Im, Kwan H.; and Ahluwalia, Rajesh K., 4,547,351, Cl. 423-242.000.
King, C. Judson; and MacKenzie, Patricia D., 4,547,293, Cl. 210-638.000.
Pitts, John R.; Thomas, Terence M.; and Czanderna, Alvin W., 4,547,432, Cl. 428-448.000.
Health and Human Services: *See—*
Letsinger, Robert L.; and Schott, Margaret E., 4,547,569, Cl. 536-29.000.
Tabor, Edward; and Gerety, Robert J., 4,547,367, Cl. 424-89.000.
Tabor, Edwar.; and Gerety, Robert J., 4,547,368, Cl. 424-89.000.
National Aeronautics and Space Administration: *See—*
Chen, Dan Y., 4,547,686, Cl. 307-570.000.
Nesmith, Malcolm F., 4,547,121, Cl. 414-753.000.
Navy: *See—*
Bolt, Conway A., Jr.; Cassen, John W.; and Schrank, Helmut E., 4,547,776, Cl. 343-741.000.
Coles, Russell I.; Griest, Norman J.; Marando, Raoul J.; and Suleske, Aaron A., 4,547,164, Cl. 441-84.000.
Ross, Jerry H., 4,547,845, Cl. 364-200.000.
Swiatosz, Edmund; and Grimmer, Paul D., 4,547,656, Cl. 219-300.000.
Wehner, Donald R.; and Prickett, Michael J., 4,547,775, Cl. 343-17.20R.
U.S. Philips Corporation: *See—*
Haisma, Jan; Adema, Cornelis L.; Pasmans, Johannes M. M.; and Walters, Jurren H., 4,547,801, Cl. 358-111.000.
Himmelbauer, Erich E., 4,547,694, Cl. 313-384.000.
Kasperkovitz, Wolfdietrich G., 4,547,744, Cl. 330-261.000.
Kasperkovitz, Wolfdietrich G., 4,547,902, Cl. 455-194.000.
Lenders, Wilhelmus L. L., 4,547,238, Cl. 156-73.200.
Lersmacher, Bernhard; and Knippenberg, Wilhelmus F., 4,547,069, Cl. 356-244.000.
Nicholas, Keith H., 4,546,534, Cl. 29-571.000.
Nieuwendijk, Joris A. M.; Sanders, Georgius B. J.; van Dijk, Cornelis D.; and Kaizer, Adrianus J. M., 4,547,631, Cl. 179-115.50R.
Roger, Bernard P.; and Vertongen, Bernard, 4,547,791, Cl. 357-43.000.
United States Robots, Inc.: *See—*
Chance, Peter E.; and Weiss, Mitchell, 4,547,119, Cl. 414-735.000.
United States Steel Corporation: *See—*
Grove, John A.; and Grove, John W., 4,546,813, Cl. 164-420.000.
United Technologies Automotive, Inc.: *See—*
Tinder, David V., 4,547,840, Cl. 362-226.000.
United Technologies Corporation: *See—*
Cornwell, Dean F., 4,547,662, Cl. 250-201.000.
Kaminski, Walter R.; and Scalise, Stanley J., 4,547,886, Cl. 372-59.000.
Mortimer, Thomas P.; and Suciu, Gabriel L., 4,546,605, Cl. 60-226.100.
University of Minnesota, Regents of the: *See—*
Case, Steven K., 4,547,037, Cl. 350-3.750.
University of Pittsburgh: *See—*
Meno, Frank, 4,546,779, Cl. 128-746.000.
University of Victoria: *See—*
Clements, Reginald M.; Ridley, John D.; and Pitt, Philip L., 4,546,740, Cl. 123-304.000.
Uno, Takaaki: *See—*
Iijima, Yoshitaka; Uno, Takaaki; and Watanabe, Mitsuru, 4,546,848, Cl. 180-312.000.
Unroe, Marilyn R.: *See—*
Reinhardt, Bruce A.; Arnold, Fred E.; and Unroe, Marilyn R., 4,547,592, Cl. 568-33.000.
UOP Inc.: *See—*
Qualeatti, Gail M., 4,547,319, Cl. 260-409.000.
Steacy, Paul C., 4,547,205, Cl. 55-25.000.
Upjohn Company, The: *See—*
Hester, Jackson B., Jr., 4,547,499, Cl. 514-235.000.
Upsher, Michael S. Laryngoscope including a laterally offset blade. 4,546,762, Cl. 128-11.000.
Urruty, Yves R. A.: *See—*
Bouiller, Jean G.; Buisson, Marc F. B.; Jourdain, Gerard E. A.; Sandelis, Denis J. M.; and Urruty, Yves R. A., 4,546,606, Cl. 60-262.000.
Usen, Norman: *See—*
Winston, Anthony; Ansaldi, Anthony; and Usen, Norman, 4,547,362, Cl. 424-49.000.
Ushijima, Shohachi: *See—*
Mukohyama, Hideaki; Hiraoka, Ryoichi; Ushijima, Shohachi; and Saito, Motoyasu, 4,547,571, Cl. 536-90.000.
USV Pharmaceutical Corp.: *See—*
Musser, John H.; and Sutherland, Charles A., 4,547,509, Cl. 514-311.000.
Vadnais, Kenneth. Chuck valve dispensing means. 4,546,906, Cl. 222-502.000.
Valdois, Michel; Maitre, Pierre; Besson, Raymond; and Boy, Jean-Jacques, to Schlumberger Technology Corporation. Piezoelectric pressure and/or temperature transducer. 4,547,691, Cl. 310-361.000.
Valentin, Ingo: *See—*
Van Den Kieboom, Jan M.; and Valentin, Ingo, 4,546,632, Cl. 72-158.000.
Valeo: *See—*
Cadars, Patrick, 4,546,797, Cl. 138-38.000.
Loizeau, Pierre, 4,547,176, Cl. 464-68.000.
Valeron Corporation, The: *See—*
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Vars, Patricia A. Head support. 4,546,504, Cl. 4-515.000.
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Vicik, Stephen J.: *See—*
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Victor, Michael. Flow measuring device with multiple-static pressure holes. 4,546,655, Cl. 73-861.660.
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Virkar, Anil V.; and Natesh, Ram, to Materials Research, Inc. In-situ on-line structural failure detection system, its preparation and operation. 4,546,652, Cl. 73-776.000.

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Visek, Tomas, to Steyr-Daimler-Puch Aktiengesellschaft. Reciprocating internal combustion engine. 4,546,738, Cl. 123-195.00C.

Vives, Van C., to Phillips Petroleum Company. Conductive polymer composition. 4,547,313, Cl. 252-518.000.

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Brinn, Walter K.; Berlec, Ivan; Davenport, John M.; Vukcevich, Milan R.; and Fridrich, Elmer G., 4,547,704, Cl. 315-71.000.

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Fujihara, Yoshiki, deceased; Fujihara, Hiroko, heiress; Sackis, John J.; and Frier, Richard A., 4,547,399, Cl. 427-138.000.

W. Schmidt GmbH & Co. KG: *See—*
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Meyer, Dietmar; and Scheibe, Horst, 4,546,845, Cl. 180-286.000.

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Walinsky, Stanley W., to Pfizer Inc. Acrylate/maleate copolymers, their preparation and use as antiscalants. 4,547,559, Cl. 526-271.000.

Walker, George R. Adjustable motorcycle passenger floorboard. 4,546,993, Cl. 280-291.000.

Waller, Robert W.; and Anschultz, Dean W., to Information International, Inc. Method and apparatus for forming high resolution halftone images. 4,547,812, Cl. 358-283.000.

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Wang, Da Y.; and Kennedy, Daniel T., to GTE Laboratories Incorporated. Gas analysis apparatus. 4,547,281, Cl. 204-424.000.

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Kiraly, Ernest F.; and Ferraro, Frank A., 4,546,544, Cl. 30-90.000.

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Watanabe, Ryuji; Iwashita, Kiyoji; Tomita, Sadami; Kuniya, Keiichi; and Tsuda, Hideaki, to Hitachi, Ltd. Vacuum circuit breaker. 4,547,639, Cl. 200-144.00B.

Watanabe, Tomonari: *See—*
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Watanabe, Tsukasa, to Yamamura Glass Kabushiki Kaisha. Apparatus for detecting faults in transparent objects. 4,547,067, Cl. 356-239.000.

Watkins Johnson Company: *See—*
Roberts, John E., 4,547,755, Cl. 333-246.000.

Watrous, Howard N.; Cash, Walter, Jr.; and Dixon, Weldon R., to Procter & Gamble Company, The. Positive control stacker. 4,547,114, Cl. 414-81.000.

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Webb, Dale W.: *See—*
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Weber, Harold J.; Kuehnle, Manfred R.; Compton, James C.; Poulakis, John N.; Szymanski, Michael J.; Lindblom, Kenneth A.; and Cleveland, Donald S., to Coulter Systems Corporation. Electrophotographic imaging apparatus and method particularly for color proofing. 4,547,061, Cl. 355-10.000.

Weber, Knut, Jr.: *See—*
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Weber, P. Stan, to Exxon Research and Engineering Co. Cyclone support system. 4,547,341, Cl. 422-147.000.

Weber S.p.A.: *See—*
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Wegner, Christian, to Bayer Aktiengesellschaft. Construction material which can be shaped under the influence of heat, a process for its preparation and its use. 4,547,561, Cl. 528-60.000.

Wehner, Donald R.; and Prickett, Michael J., to United States of America, Navy. Frequency agile imaging radar with error frequency correction. 4,547,775, Cl. 343-17.20R.

Wehrenberg, Peter K., to Stauffer Chemical Company. Method of producing herbicide intermediates. 4,547,582, Cl. 560-060.000.

Weil, Jack M.: *See—*
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Weiler, David W., to Union Carbide Corporation. Gas liquid contacting tray. 4,547,326, Cl. 261-114.00R.

Weinstein, Eric. Beach kit including convertible bag-pillow cover. 4,546,507, Cl. 5-419.000.

Weis, Philip J.; and Cook, Richard A., to Dana Corporation. Countershaft driven power take-off. 4,546,661, Cl. 74-15.400.

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Weiss, Mitchell: *See*—
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Welch, David P.; and Bennett, David R., to Procter & Gamble Company, The. Continuous motion spiral stacker. 4,547,113, Cl. 414-49.000.

Welch, M. Bruce, to Phillips Petroleum Company. Olefin conversion. 4,547,617, Cl. 585-646.000.

Wellington, Leslie J.: *See*—
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Wells, Daniel Graham: *See*—
Wells, David W., 4,546,919, Cl. 236-48.00R.

Wells, David W., to Pierce, Jennifer Margaret; Wells, Daniel Graham; and Wells, Gordon William. Ventilator actuator. 4,546,919, Cl. 236-48.00R.

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Wells, Rodney L., to Allied Corporation. Additive dispersions and process for their incorporation with fiber-forming polymer. 4,547,546, Cl. 524-313.000.

Wenzel, Werner; and Ollik, Reinhard. Device for the mechanical processing of fish and introducing the same into cans. 4,546,520, Cl. 17-59.000.

Wesch, Ludwig: *See*—
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Westinghouse Electric Corp.: *See*—
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Freitag, Ronald G.; Degenford, James E.; and Boire, Daniel C., 4,547,745, Cl. 330-286.000.
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Husson, Alan L.; and Tinios, Pantelis G., 4,547,732, Cl. 324-166.000.
Isenberg, Arnold O.; Ruka, Roswell J.; and Zymboly, Gregory E., 4,547,437, Cl. 429-30.000.
Lanyi, William D.; and Clements, Jack W., 4,547,855, Cl. 364-474.000.
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Westvaco Corporation: *See*—
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Whalen, Barry H.: *See*—
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Whisco Component Engineering, Inc.: *See*—
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White, Wayne; and Williams, Jim, to Whisco Component Engineering, Inc. Electrical tap connector. 4,547,033, Cl. 339-97.00R.

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Whitson, Donald W. Feed box monitoring device. 4,547,660, Cl. 235-103.000.

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Wicker, James A. Articulated rigid cover assembly for truck beds. 4,547,014, Cl. 296-100.000.

Wickman, James J.: *See*—
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Wickstrom, Sven: *See*—
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Wieland, Heinz, to Wilhelm Gebhardt GmbH. Rotor for a regenerative heat exchanger. 4,546,817, Cl. 165-10.000.

Wiggins, Gene D., to S & W Instruments, Inc. Methods for scaling and calibrating predetermined signals. 4,547,859, Cl. 364-571.000.

Wilburth, Daniel N. Desk top organizer. 4,546,708, Cl. 108-94.000.

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Wilke, Konrad: *See*—
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Will, Brian C.: *See*—
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Willenbacher, Erich, to Pfaff Industriemaschinen GmbH. Sewing machine having the needle holder magazine with automatic coupling and decoupling of thread containing needles and needle holders. 4,546,712, Cl. 112-89.000.

Williams, Jim: *See*—
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Williams, John C.: *See*—
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Williams, W. Jerry, to Omico Plastics, Inc. Apparatus and method for producing molded hollow article with filling of foamed plastic thermal insulation, and article produced thereby. 4,546,899, Cl. 220-444.000.

Williamson, Carlton R.; and Peterson, Fred M. Horizontal earth boring directional guide. 4,546,835, Cl. 175-40.000.

Wilson, Frederick G. Trailer for an articulated vehicle. 4,546,969, Cl. 296-181.000.

Winchel, Joseph F. Portable platform for slide projection. 4,546,942, Cl. 248-187.000.

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Winkler, Robert, to Sulzer-Escher Wyss Ltd. Treatment of brine elutriate. 4,547,197, Cl. 23-302.00T.

Winquist, Knut L., to Southwest Research Institute. Fuel injector. 4,546,924, Cl. 239-533.400.

Winslow, Earl S., Jr.: *See*—
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Winston, Anthony; Ansaldi, Anthony; and Usen, Norman, to Church & Dwight Co., Inc. Sodium-bicarbonate-containing tooth powder. 4,547,362, Cl. 424-49.000.

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Wirz, Peter: *See*—
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Withers, Howard P., Jr.: *See*—
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Witter, David E.; and Bawa, Mohendra S., to Texas Instruments Incorporated. Deposition of silicon at temperatures above its melting point. 4,547,258, Cl. 156-605.000.

Wittern, Klaus-Peter: *See*—
Hoppe, Udo; Wittern, Klaus-Peter; Sauermann, Gerhard; Stelling, Otto; and Rockl, Manfred, 4,547,307, Cl. 252-107.000.

Wocher, Bertold: *See*—
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Wolaver, Dan H.; and Little, Warren E., to General Signal Corporation. Phase locked loop for high speed data. 4,547,747, Cl. 331-17.000.

Wolf, Anthony D., to Du Pont de Nemours, E. I., and Company. Herbicidal sulfonamides. 4,547,215, Cl. 71-92.000.

Wong, Rayman Y.; and Bunker, Nathan S., to Stauffer Chemical Company. Method for preparation of N-phosphonomethylglycine. 4,547,324, Cl. 260-502.40R.

Wong, Thomas S. W., to Advanced Micro Devices, Inc. Sense amplifier circuit for semiconductor memories. 4,547,685, Cl. 307-530.000.

Wood, James G., to Sunpower, Inc. Drive linkage for Stirling cycle and other machines. 4,546,663, Cl. 74-40.000.

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Worns, John R.; Chase, James W.; and Capriotti, Bruce W., to Uniroyal, Inc. Compressible photopolymer printing plate. 4,547,453, Cl. 430-271.000.

Wudy, Erich: *See*—
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Wulff, Richard W., to Bourns, Inc. Leadless chip carrier with frangible shorting bars. 4,547,795, Cl. 357-80.000.

Wunderlich, Erhard: *See*—
Noel, Alois; Zeitvogel, Josef; Wunderlich, Erhard; and Meichsner, Michael, 4,547,135, Cl. 417-360.000.

Xerox Corporation: *See*—
Ammenheuser, Herbert H.; and Fantuzzo, Joseph, 4,547,064, Cl. 355-15.000.
Lindblad, Nero R., 4,547,060, Cl. 355-3.00R.
Logtens, Jozef P. M., 4,546,910, Cl. 227-155.000.
Stange, Klaus K., 4,547,063, Cl. 355-15.000.

Ximenes, Victor: *See*—
Rockwood, Robert E.; and Ximenes, Victor, 4,547,771, Cl. 340-683.000.

Xomed, Inc.: *See*—
Benson, Jon M.; and Castle, Craig A., 4,547,894, Cl. 381-70.000.
Yabase, Koji, to Denki Onkyo Company Limited. Deflection yoke apparatus. 4,547,707, Cl. 315-368.000.
Yagi Antenna Co., Ltd.: *See*—
Nakata, Yukio; and Shiotsu, Osamu, 4,547,751, Cl. 332-16.00R.
Yamada, Hiromi: *See*—
Murakami, Yoshikazu; and Yamada, Hiromi, 4,547,754, Cl. 333-219.000.
Yamada, Junsaku: *See*—
Yasumune, Masaru; Yamada, Junsaku; and Kurokawa, Sumiaki, 4,546,595, Cl. 53-450.000.
Yamada, Keiichi: *See*—
Nakajima, Nobuyuki; and Yamada, Keiichi, 4,546,739, Cl. 123-299.000.
Yamada, Makoto: *See*—
Suzuki, Ichiro; Motonami, Masanao; Yamada, Makoto; and Yoshitsugu, Noritada, 4,546,998, Cl. 280-807.000.
Yamada, Toshiaki, to Matsushita Electric Industrial Co., Ltd. Electromagnet yoke structure. 4,547,757, Cl. 335-296.000.
Yamada, Yasuo, to Yoshida Kogyo K. K. Method of and apparatus for piling up tapes. 4,546,935, Cl. 242-170.000.
Yamada, Yoshihisa: *See*—
Oine, Toyonari; Yamada, Yoshihisa; Wagatsuma, Mitsuyoshi; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,547,494, Cl. 514-204.000.
Yamada, Yoshio: *See*—
Kojima, Akira; Yoshida, Saburo; Yamada, Yoshio; Shioda, Seiji; and Isoshima, Kazumi, 4,547,423, Cl. 428-315.500.
Yamagata, Tetsuo: *See*—
Sato, Toshihiko; and Yamagata, Tetsuo, 4,546,746, Cl. 123-478.000.
Yamaguchi, Shin: *See*—
Kitagishi, Nozomu; Yamaguchi, Shin; Sakai, Shinji; Kinoshita, Takao; Kawabata, Takashi; Shinoda, Nobuhiko; and Hosoe, Kazuya, 4,547,663, Cl. 250-201.000.
Yamaguchi, Totaro: *See*—
Oine, Toyonari; Yamada, Yoshihisa; Wagatsuma, Mitsuyoshi; Yamaguchi, Totaro; and Ohshima, Satoshi, 4,547,494, Cl. 514-204.000.
Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Yasui, Toshihiro, 4,546,842, Cl. 180-193.000.
Yamamoto, Haruhisa, to Nippon Zeon Co. Ltd. Process for producing conjugated diolefins. 4,547,615, Cl. 585-621.000.
Yamamoto, Shoichi: *See*—
Matsumoto, Kenji; Yamamoto, Shoichi; and Hayashi, Jun, 4,547,798, Cl. 358-44.000.
Yamamoto, Takashi; and Sakunaga, Kenichi, to Mitsubishi Rayon Co., Ltd. Optical fiber assembly and process for preparing same. 4,547,040, Cl. 350-96.340.
Yamamoto, Yoshiko: *See*—
Tamai, Kenzo; Saikawa, Isamu; Yasuda, Takashi; Murakami, Shohachi; Maeda, Toyoo; Tsuda, Hisatsugu; Sakai, Hiroshi; Sugita, Masatoshi; Yamamoto, Yoshiko; Minami, Hisashi; and Hori, Takako, 4,547,462, Cl. 435-72.000.
Yamamoto, Yoshimi: *See*—
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Yamamoto, Yoshinori: *See*—
Ri, Masao; Ohhara, Kenji; Yamamoto, Yoshinori; Takada, Akira; Watanabe, Hisanori; and Osada, Yasuo, 4,547,823, Cl. 360-90.000.
Yamamura Glass Kabushiki Kaisha: *See*—
Watanabe, Tsukasa, 4,547,067, Cl. 356-239.000.
Yamanaka, Masashige: *See*—
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Yamanaka, Toru; and Yoshimura, Tadatoshi, to Mitsui Petrochemical Industries, Ltd. Process for preparing tetrakis [3-(3,5-dibutyl-4-hydroxyphenyl)propionyloxymethyl] methane. 4,547,585, Cl. 560-075.000.
Yamane, Yoshio: *See*—
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Yamanoi, Hiroshi: *See*—
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Yamaoka, Nobutatsu: *See*—
Masuyama, Masaru; Hirooka, Susumu; and Yamaoka, Nobutatsu, 4,547,314, Cl. 252-520.000.
Yamasawa, Akira; Itami, Teruhiko; and Kimoto, Toshifumi, to Fuji Xerox Co., Ltd. Magnetic printer. 4,547,782, Cl. 346-74.400.
Yamashita, Kiyoshi: *See*—
Iijima, Toshifumi; and Yamashita, Kiyoshi, 4,547,458, Cl. 430-505.000.
Yamatsuta, Kohji; and Nishio, Ken-ichi, to Sumitomo Chemical Company, Ltd. Method for preparing fiber-reinforced metal composite material. 4,547,435, Cl. 428-614.000.
Yamauchi, Juichi, to Sharp Kabushiki Kaisha. Temperature sensing probe for microwave oven application. 4,547,643, Cl. 219-10.55R.
Yamauchi, Shiro, to Mitsubishi Denki Kabushiki Kaisha. Insulating gas for electric device. 4,547,316, Cl. 252-571.000.
Yamauchi, Yoshio, to Rohm Company Limited. Device for protection of a semiconductor device. 4,547,830, Cl. 361-104.000.
Yamawaki, Masami: *See*—
Kasuga, Takuzo; Asano, Takeshi; Ikenaga, Yukio; Yamawaki, Masami; Takeda, Yasuyuki; and Ichimura, Koichi, 4,547,565, Cl. 528-232.000.
Yamazaki, Kengo: *See*—
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Yamazaki Machinery Works, Ltd.: *See*—
Hashimoto, Hideo; Tomori, Katsuhiko; and Sano, Yuji, 4,547,854, Cl. 364-474.000.
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Yashin, Jury A.: *See*—
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Yasuda, Hirohiko: *See*—
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Yasuda, Takashi: *See*—
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Yasuda, Tomio: *See*—
Tanigaki, Shuzo; Yasuda, Tomio; and Sakaki, Masayuki, 4,547,769, Cl. 340-626.000.
Yasui, Toshihiro, to Yamaha Hatsudoki Kabushiki Kaisha. Slide rail track drive system for a snowmobile. 4,546,842, Cl. 180-193.000.
Yasumune, Masaru; Yamada, Junsaku; and Kurokawa, Sumiaki, to Kabushiki Kaisha Furukawa Seisakusho; and Furukawa Kogyo Kabushiki Kaisha. Method and apparatus for packaging articles of various sizes with a continuous length of heat sealable film. 4,546,595, Cl. 53-450.000.
Yeakey, Ernest L.: *See*—
Brennan, Michael E.; Templeton, James H.; and Yeakey, Ernest L., 4,547,591, Cl. 564-479.000.
Yeoman, Alan M., to Nalco Chemical Company. Corrosion protection in cooling water systems. 4,547,540, Cl. 524-130.000.
Yergeau, Joseph L. P. M.: *See*—
Gill, Bernard B. J.; and Yergeau, Joseph L. P. M., 4,546,659, Cl. 73-864.620.
Yeung, Kwok K.: *See*—
Turanchik, Michael F.; Yeung, Kwok K.; and Smith, Nathan L., 4,547,466, Cl. 436-509.000.
Yewman, Peter W. W.: *See*—
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Yokohara, Takashi: *See*—
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Yokoi, Tsutomu: *See*—
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Yokokura, Takashi: *See*—
Sasaki, Tsuneo; Ohtomo, Fumio; Yokokura, Takashi; and Kondo, Fumitomo, 4,547,667, Cl. 250-231.0SE.
Yokoshima, Teruaki: *See*—
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Yonkers, Edward H.: *See*—
McCreedy, Kathleen M.; Pawloski, James C.; Keskkula, Henno; and Yonkers, Edward H., 4,547,530, Cl. 521-139.000.
Yoshida, Kenichi; Yokohara, Takashi; Ono, Kimizo; Nishiwaki, Yoshikazu; and Tsuno, Koichi, to Sumitomo Electric Industries, Ltd. Optical fiber gyro. 4,547,072, Cl. 356-350.000.
Yoshida Kogyo K. K.: *See*—
Gartner, Karl, 4,546,582, Cl. 52-235.000.
Yamada, Yasuo, 4,546,935, Cl. 242-170.000.
Yoshida, Saburo: *See*—
Kojima, Akira; Yoshida, Saburo; Yamada, Yoshio; Shioda, Seiji; and Isoshima, Kazumi, 4,547,423, Cl. 428-315.500.
Yoshida, Takao: *See*—
Light, Kenneth K.; Schreiber, William L.; McGhie, Joseph A.; Schreck, Ronald P.; Yoshida, Takao; Schreiber, Loren B.; and Muralidhara, Ranya, 4,547,594, Cl. 568-392.000.
Yoshida, Takashi: *See*—
Mita, Kikuo; Oyama, Masayuki; Yoshida, Takashi; Nakashima, Masato; Fujihara, Katsumi; and Nakakuki, Tadao, 4,547,895, Cl. 382-8.000.
Yoshida, Yoshinori: *See*—
Shinohara, Hironobu; Kubota, Kiyonobu; and Yoshida, Yoshinori, 4,547,200, Cl. 44-51.000.
Yoshikawa, Hiroshi: *See*—
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Yoshimura, Tadatoshi: *See*—
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Yoshino Kogyosho Co., Ltd.: *See*—
Takada, Takuzo, 4,547,333, Cl. 264-532.000.
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Younan, Hany R.: *See*—
Isherwood, David P.; and Younan, Hany R., 4,546,654, Cl. 73-844.000.
Young, Horace J.; Becker, Robert F.; and Will, Brian C. Drill pipe handling and placement apparatus. 4,547,109, Cl. 414-22.000.
Young, Rodney C.: *See*—
Jones, Martin; and Young, Rodney C., 4,547,512, Cl. 514-341.000.
Young Sangyo Co., Ltd.: *See*—
Horimoto, Yukihiro, 4,547,171, Cl. 446-370.000.
Young, William C.: *See*—
Butt, Donald B.; and Young, William C., 4,547,649, Cl. 219-121.0LF.
Youngdale, Ralph A. Portable wine rack. 4,546,883, Cl. 206-521.000.
Yow, Larry R., to Modern Globe, Inc. Press construction. 4,547,255, Cl. 156-580.000.
Yukishige, Yoshifumi; Toyokuni, Kazuo; and Kuroiwa, Yoshizo, to Kubota, Ltd. Travelling vehicle equipped with obstacle detector sensors. 4,546,840, Cl. 180-169.000.
Yukumoto, Masao: *See*—
Shibuya, Kiyoshi; Yukumoto, Masao; Kan, Takahiro; and Ito, Yo, 4,546,814, Cl. 164-455.000.
Yuto, Masao; and Suzuki, Yoichi, to Sumitomo Electric Industries, Ltd. Method for producing foamed plastic insulator. 4,547,328, Cl. 264-45.900.
Zabrocki, Karl; Tiburtius, Christoph; Doring, Joachim; and Richter, Klaus, to Bayer Aktiengesellschaft. Glass-fiber-reinforced ABS-molding compositions. 4,547,533, Cl. 523-206.000.
Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Yoneta, Toshio; and Fukatsu, Shunzo, 4,547,492, Cl. 514-41.000.
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Tanaka, Wataru; Takita, Tomohisa; Nishimura, Yoshio; and Yoshikawa, Hiroshi, 4,547,567, Cl. 536-17.200.
Zajac, John P.: *See*—
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Zanno, Paul R.: *See*—
Riemer, Jed A.; Zanno, Paul R.; and Barnett, Ronald E., 4,547,584, Cl. 560-71.000.
Zarchy, Andrew S., to General Electric Company. Supercritical fluid extraction and enhancement for liquid liquid extraction processes. 4,547,292, Cl. 210-634.000.
Zboril, Vaclay G.: *See*—
Hamilton, Michael A.; and Zboril, Vaclay G., 4,547,473, Cl. 502-113.000.
Zehner, Lee R.: *See*—
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Zeidler, Georg: *See*—
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Zeitvogel, Josef: *See*—
Noel, Alois; Zeitvogel, Josef; Wunderlich, Erhard; and Meichsner, Michael, 4,547,135, Cl. 417-360.000.
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Saleeb, Fouad Z.; and Zeller, Bary L., 4,547,378, Cl. 426-271.000.
Zeller, Hans: *See*—
Kleger, Ferdinand; and Zeller, Hans, 4,546,546, Cl. 30-273.000.
Zenith Electronics Corporation: *See*—
Baker, Roy F.; and Banach, Frank G., 4,547,805, Cl. 358-195.100.
Gioia, Norman F.; and Seher, Fred H., 4,547,698, Cl. 313-414.000.
Strauss, Paul, 4,547,696, Cl. 313-407.000.
Zierenberg, Bernd; and Gupte, Arun R., to Boehringer Ingelheim KG. Divisible pharmaceutical tablet with delayed active ingredient release. 4,547,359, Cl. 424-22.000.
Zilligen, James A.; and Feeny, Richard J. Method of prefabricating an electrical connector. 4,547,240, Cl. 156-85.000.
Zima Products, Ltd.: *See*—
Lee, James S. W.; Chow, Kwong-Wai; Lau, Alfred T. Y.; and Chow, Ming-Ngar, 4,547,174, Cl. 446-463.000.
Zimmerman, Morris: *See*—
Doherty, James B.; Ashe, Bonnie M.; Finke, Paul E.; Shah, Shrenik K.; Thompson, Kevan R.; and Zimmerman, Morris, 4,547,371, Cl. 514-200.000.
Zincroksid S.p.A.: *See*—
Bruno, Roberto; and Memmi, Massimo, 4,547,268, Cl. 204-28.000.
Zitzmann, Hubertus, to W. Schmidt GmbH & Co. KG. Spiral heat exchanger. 4,546,826, Cl. 165-163.000.
Zsadon, Bela: *See*—
Fenyvesi, Eva; Szejtli, Jozsef; Zsadon, Bela; Antal, Balazs; and Wagner nee Kohary, Ildiko , 4,547,572, Cl. 536-103.000.
Zuest, Max; and Zuest, Paul. Snap-in anchor for denture. 4,547,159, Cl. 433-181.000.
Zuest, Paul: *See*—
Zuest, Max; and Zuest, Paul, 4,547,159, Cl. 433-181.000.
Zwaans, Joseph. Overload-security for staking machines for leather industry. 4,546,626, Cl. 69-33.000.
Zweber, Cyril J., to Zweber, Pauline C. Coin wrapper. 4,546,875, Cl. 206-0.820.
Zweber, Pauline C.: *See*—
Zweber, Cyril J., 4,546,875, Cl. 206-0.820.
Zweifel, Charles H.: *See*—
Martin, John F.; and Zweifel, Charles H., 4,546,852, Cl. 182-12.000.
Zwick, Eugene B. Prevaporizing combustion method. 4,546,610, Cl. 62-52.000.
Zymboly, Gregory E.: *See*—
Isenberg, Arnold O.; Ruka, Roswell J.; and Zymboly, Gregory E., 4,547,437, Cl. 429-30.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 15TH DAY OF OCTOBER, 1985

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Chabala, John C.; Fisher, Michael H.; and Mrozik, Helmut H., to Merck & Co., Inc. 13-Halo and 13-deoxy C-076 compounds. Re. 32,006, Cl. 549-264.000.

Clancy, Robert E. Two-sided puzzle. Re. 32,004, Cl. 273-153.00S.

Fisher, Michael H.: *See*—
Chabala, John C.; Fisher, Michael H.; and Mrozik, Helmut H., Re. 32,006, Cl. 549-264.000.

Hitachi Metals, Ltd.: *See*—
Miyazaki, Takeshi, Re. 32,005, Cl. 148-31.550.

Kawachi, Hideo: *See*—
Nakamichi, Niro; Kobayashi, Kozo; and Kawachi, Hideo, Re. 32,007, Cl. 360-69.000.

Kobayashi, Kozo: *See*—
Nakamichi, Niro; Kobayashi, Kozo; and Kawachi, Hideo, Re. 32,007, Cl. 360-69.000.

Merck & Co., inc.: *See*—
Chabala, John C.; Fisher, Michael H.; and Mrozik, Helmut H., Re. 32,006, Cl. 549-264.000.

Miyazaki, Takeshi, to Hitachi Metals, Ltd. Magnetic alloy having a low melting point. Re. 32,005, Cl. 148-31.550.

Mrozik, Helmut H.: *See*—
Chabala, John C.; Fisher, Michael H.; and Mrozik, Helmut H., Re. 32,006, Cl. 549-264.000.

Nakamichi Corporation: *See*—
Nakamichi, Niro; Kobayashi, Kozo; and Kawachi, Hideo, Re. 32,007, Cl. 360-69.000.

Nakamichi, Niro; Kobayashi, Kozo; and Kawachi, Hideo, to Nakamichi Corporation. Mode changing system for a cassette tape recorder. Re. 32,007, Cl. 360-69.000.

Shoberg, Ralph S.; and Ulicny, Thomas A. Constant moment weigh scale with floating flexure beam. Re. 32,002, Cl. 177-24.000.

Shoberg, Ralph S. Constant moment weigh scale with floating flexure beam. Re. 32,003, Cl. 177-211.000.

Ulicny, Thomas A.: *See*—
Shoberg, Ralph S.; and Ulicny, Thomas A., Re. 32,002, Cl. 177-24.000.

LIST OF DESIGN PATENTEES

Abate, Robert E., to Polaroid Corporation. Sunglass lens or similar article. 280,994, 10-15-85, Cl. D16-112.000.

Abbott, Jane C.: *See*—
Kirshner, David M.; Paris, Patricia; Bollinger, Howard N.; Goldberg, Dale I.; Abbott, Jane C.; and Haupt, Linda, 281,004, Cl. D21-171.000.

Airwick Industries, Inc.: *See*—
Joyaux, Yves, 281,010, Cl. D23-150.000.

Alex Synn AG: *See*—
Hopfer, Hans, 280,955, Cl. D6-361.000.

Austin, Arnold S.; and Hill, David J., to Quabaug Rubber Company. Shoe sole. 280,950, 10-15-85, Cl. D2-320.000.

Bainbridge, William J. Toy bear in formal dress. 281,003, 10-15-85, Cl. D21-159.000.

Beck, Richard W.; Mandy, Kenneth R.; and Yates, William G., to Warner-Lambert Company. Electrocardiographic electrode. 281,012, 10-15-85, Cl. D24-29.000.

Bollinger, Howard N.: *See*—
Kirshner, David M.; Paris, Patricia; Bollinger, Howard N.; Goldberg, Dale I.; Abbott, Jane C.; and Haupt, Linda, 281,004, Cl. D21-171.000.

British Telecommunications: *See*—
Williams, John K., 280,989, Cl. D14-62.000.

Brown, Jeffrey L. Angulated venipuncture needle. 281,014, 10-15-85, Cl. D24-52.000.

Burke, Estill; and Whitney, Rolland L. Bird house. 281,026, 10-15-85, Cl. D30-3.000.

Carousel Group, Inc., The: *See*—
Prophet, Wilson B., Jr.; Wolfe, William G.; and Simmons, Thomas J., 280,965, Cl. D7-81.000.
Prophet, Wilson B., Jr.; Wolfe, William G.; and Simmons, Thomas J., 280,966, Cl. D7-81.000.

Cavnar, Kathryn A., to CPG Products Corp. Toy doll house. 280,999, 10-15-85, Cl. D21-115.000.

Chesebrough-Pond's Inc.: *See*—
Helfer, Joel N., 281,011, Cl. D24-17.000.

Color Process Company, Inc.: *See*—
Sperry, Robert K., 280,959, Cl. D6-517.000.

Conair Corporation: *See*—
Pajak, Witold, 281,019, Cl. D28-13.000.
Rittenhouse, James M., 280,954, Cl. D4-128.000.
Rittenhouse, James M., 281,020, Cl. D28-18.000.
Rittenhouse, James M.; and Stewart, James B., 281,021, Cl. D28-29.000.
Rittenhouse, James M., 281,022, Cl. D28-35.000.
Rittenhouse, James M.; and Stewart, James B., 281,023, Cl. D28-35.000.
Rittenhouse, James M.; and Leung, Anthony, 281,024, Cl. D28-38.000.

CPG Products Corp.: *See*—
Cavnar, Kathryn A., 280,999, Cl. D21-115.000.
Effler, Timothy A.; and Goldberg, Dale I., 280,998, Cl. D21-115.000.
Kirshner, David M.; Paris, Patricia; Bollinger, Howard N.; Goldberg, Dale I.; Abbott, Jane C.; and Haupt, Linda, 281,004, Cl. D21-171.000.

Cridland, Michael; and Moriconi, David P., to Victor Technologies, Inc. CRT Display housing. 280,989, 10-15-85, Cl. D14-113.000.

Dart Industries Inc.: *See*—
Wolff, Martin J., 280,964, Cl. D7-79.000.

Davidson, William G., to Harley-Davidson Motor Co., Inc. Motorcycle engine rocker cover. 280,990, 10-15-85, Cl. D15-5.000.

Diamond, Jeffrey H., to J. H. Diamond Company. Packaging tray insert for a container. 280,976, 10-15-85, Cl. D9-456.000.

Dodd, Malcolm J.; and Juhas, Joseph A., to PTC Aerospace Inc. Food service tray. 280,960, 10-15-85, Cl. D7-38.000.

Domingue, Ivan J. Combination ashtray and drink stand. 281,016, 10-15-85, Cl. D27-12.000.

Dow Chemical Company, The: *See*—
Hutter, Wayne R.; Moses, Paul J.; and Kosinski, James E., 281,008, Cl. D23-72.000.
Moses, Paul J.; Kosinski, James E.; and Hutter, Wayne R., 281,009, Cl. D23-72.000.

Doyel, John S. Belt mounted massaging unit. 281,013, 10-15-85, Cl. D24-40.000.

Durushia, Ray D. Sit-up exercise anchor. 281,006, 10-15-85, Cl. D21-191.000.

Effler, Timothy A.; and Goldberg, Dale I., to CPG Products Corp. Toy doll house. 280,998, 10-15-85, Cl. D21-115.000.

Epstein, Melvin, to Quaker Oats Company, The. Stringing beads. 280,996, 10-15-85, Cl. D21-59.000.

Ernst Stadelmann Gesellschaft m.b.H.: *See*—
Kirchner, Balthasar, 280,952, Cl. D3-35.000.

Federal Signal Corporation: *See*—
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1.28 4,546,687
327 4,546,688
477 R 4,546,690
505 4,546,689

CLASS 91

376 R 4,546,691

CLASS 92

12.2 4,546,692

CLASS 98

2 4,546,693
2.18 4,546,696
34.6 4,546,694
121.2 4,546,695

CLASS 99

279 4,546,697

CLASS 100

121 4,546,698

CLASS 101

93.14 4,546,699
211 4,546,700
349 4,546,701
415.1 4,546,702

CLASS 102

333 4,546,703
444 4,546,704
520 4,546,705

CLASS 105

52 E 4,546,706
199 R 4,546,707

CLASS 106

21 4,547,222
90 4,547,223
273 4,547,224
273 N 4,547,225

CLASS 108

94 4,546,708

CLASS 110

216 4,546,709
246 4,546,711
263 4,546,710

CLASS 112

89 4,546,712
141 4,546,713
155 4,546,714
162 4,546,715
4,546,716
313 4,546,717

CLASS 114

39 4,546,718
40 4,546,719
98 4,546,720
230 4,546,721

CLASS 118

657 4,546,722
669 4,546,723
4,546,724
718 4,546,725
719 4,546,726

CLASS 119

1 4,546,727
19 4,546,728
37 4,546,729
117 4,546,730

CLASS 122

367 R 4,546,731

CLASS 123

1 A 4,546,732
41.05 4,546,742
52 MB 4,546,733
90.16 4,546,734
90.17 4,546,735
179 G 4,546,736
188 S 4,546,737
190 A 4,546,743
195 C 4,546,738
299 4,546,739
304 4,546,740
337 4,546,741
339 4,546,744
387 4,546,745
478 4,546,746
489 4,546,747
494 4,546,748
506 4,546,749
514 4,546,750
568 4,546,751
4,546,752
634 4,546,753

CLASS 124

86 4,546,754

CLASS 125

21 4,546,755

CLASS 126

424 4,546,756
438 4,546,757
451 4,546,758

CLASS 127

41 4,547,226

CLASS 128

1 D 4,546,759
4,546,760
6 4,546,761
11 4,546,762
25 R 4,546,763
33 4,546,764
55 4,546,765
71 4,546,766
92 E 4,546,767
200.16 4,546,768
335.5 4,546,769
630 4,546,770
660 4,546,771
4,546,772
4,546,773
673 4,546,774
681 4,546,775
704 4,546,776
715 4,546,777
718 4,546,778
746 4,546,779

CLASS 131

304 4,546,780

CLASS 132

31 R 4,546,781
91 4,546,782

CLASS 134

7 4,547,227
109 4,546,783

CLASS 136

249 4,547,622
249 TJ 4,547,621

CLASS 137

13 4,546,784
85 4,546,785
117 4,546,786
119 4,546,787
242 4,546,788
245.5 4,546,789
315 4,546,790
512 4,546,791
527 4,546,792
554 4,546,793
599 4,546,794
624.15 4,546,795
625.48 4,546,796

CLASS 138

38 4,546,797
149 4,546,798

CLASS 139

1 C 4,546,799
66 A 4,546,800
110 4,546,801
336 4,546,802
449 4,546,803

CLASS 144

1 G 4,546,804
34 R 4,546,805
345 4,546,806

CLASS 148

16 4,547,228
31.55 Re.32,005
134 4,547,229
171 4,547,230
175 4,547,231

CLASS 149

2 4,547,232
4,547,233
3 4,547,234
35 4,547,235

CLASS 152

41 4,546,807
209 R 4,546,808

CLASS 156

69 4,547,236
70 4,547,237
73.2 4,547,238
73.5 4,547,239
85 4,547,240
96 4,547,241
105 4,547,242
164 4,547,243
167 4,547,244
220 4,547,245
244.12 4,547,246
345 4,547,247
4,547,248
363 4,547,249
384 4,547,250
415 4,547,251
497 4,547,252
553 4,547,253
555 4,547,254
580 4,547,255
603 4,547,256
4,547,257
605 4,547,258
607 4,547,259
643 4,547,260
4,547,261
659.1 4,547,262

CLASS 160

126 4,546,809

CLASS 162

14 4,547,263
37 4,547,264
164.6 4,547,265
252 4,547,266

CLASS 164

37 4,546,810
66.1 4,546,811
130 4,546,812
420 4,546,813
455 4,546,814
463 4,546,815
465 4,546,816

CLASS 165

10 4,546,817
47 4,546,818
70 4,546,819
77 4,546,820
96 4,546,821
149 4,546,822
4,546,823

153 4,546,824
159 4,546,825
163 4,546,826
165 4,546,827

CLASS 166

84 4,546,828
267 4,546,829
370 4,546,830

CLASS 172

13 4,546,831
260.5 4,546,832

CLASS 173

12 4,546,833
146 4,546,834

CLASS 174

35 R 4,547,623
52 FP 4,547,624
68.5 4,547,625
107 4,547,626
138 F 4,547,627

CLASS 175

40 4,546,835
107 4,546,836
340 4,546,837

CLASS 177

24 Re.32,002
211 Re.32,003
4,546,838

CLASS 178

2 B 4,547,628

CLASS 179

81 R 4,547,629
89 4,547,630
115.5 R 4,547,631
115.5 VC 4,547,632
175.3 F 4,547,633

CLASS 180

142 4,546,839
169 4,546,840
181 4,546,841
193 4,546,842
229 4,546,843
243 4,546,844
286 4,546,845
287 4,546,846
307 4,546,847
312 4,546,848
326 4,546,849

CLASS 181

141 4,546,850

CLASS 182

7 4,546,851
12 4,546,852
103 4,546,853
4,546,854
106 4,546,855
228 4,546,856

CLASS 186

37 4,546,857

CLASS 188

24.19 4,546,858
67 4,546,859
71.4 4,546,860
79.5 GE 4,546,861
331 4,546,862

CLASS 190

102 4,546,863

CLASS 192

41 A 4,546,864
84 C 4,546,865
107 C 4,546,866

CLASS 194

1 D 4,546,867
97 A 4,546,868
99 4,546,869

CLASS 198

400 4,546,870
425 4,546,871
525 4,546,872
836 4,546,873

CLASS 200

50 C 4,547,634
52 R 4,547,635
61.54 4,547,636
82 R 4,547,637
144 B 4,547,638
4,547,639
4,547,640

CLASS 204

4 4,547,267
28 4,547,268
34 4,547,269
58.5 4,547,270
59 R 4,547,271
67 4,547,272
73 R 4,547,273
129.4 4,547,274
129.75 4,547,275
192 M 4,547,276
252 4,547,277
290 R 4,547,278
298 4,547,279
403 4,547,280
424 4,547,281

CLASS 206

0.82 4,546,875
150 4,546,876
315.11 4,546,877
343 4,546,878
391 4,546,879
410 4,546,880
459 4,546,881
484 4,546,882
521 4,546,883
611 4,546,884

CLASS 208

8 LE 4,547,282
46 4,547,283
50 4,547,284
89 4,547,285

CLASS 209

548 4,546,885
665 4,546,886

CLASS 210

149 4,547,287
232 4,547,288
634 4,547,292
638 4,547,293
652 4,547,289
670 4,547,291
697 4,547,294
738 4,547,286
751 4,547,290
777 4,547,295
778 4,547,296

CLASS 211

49.1 4,546,887
87 4,546,888
105.3 4,546,889

CLASS 212

98 4,546,890
221 4,546,891

CLASS 215

252 4,546,892
4,546,893
354 4,546,894

CLASS 219

10.41 4,547,641
10.49 R 4,547,644
10.55 B 4,547,642
10.55 R 4,547,643
10.67 4,547,645
69 W 4,547,646
4,547,647
121 LD 4,547,652
121 LE 4,547,650
121 LF 4,547,649
121 LG 4,547,651
121 PE 4,547,648
124.34 4,547,653
137 PS 4,547,654
204 4,547,655
300 4,547,656
492 4,547,657
539 4,547,658
544 4,547,659

CLASS 220

3 4,546,895
4 B 4,546,874
4 F 4,546,896
277 4,546,897
337 4,546,898
444 4,546,899
453 4,546,900

CLASS 221

10 4,546,901

CLASS 222

129.2 4,546,902
130 4,546,903
185 4,546,904
189 4,546,905
502 4,546,906
590 4,546,907

CLASS 226

74 4,546,908

CLASS 227

120 4,546,909
155 4,546,910

CLASS 229

5.6 4,546,911
17 G 4,546,915
30 4,546,912
33 4,546,913
52 B 4,546,914

CLASS 235

103 4,547,660
482 4,547,661

CLASS 236

44 A 4,546,916
44 C 4,546,917
46 R 4,546,918
48 R 4,546,919

CLASS 239

102 4,546,920
125 4,546,921
304 4,546,922
406 4,546,923
533.4 4,546,924

CLASS 241

1 4,546,925
39 4,546,926
74 4,546,927
95 4,546,928
294 4,546,929

CLASS 242

56 R 4,546,930
67.2 4,546,931
84.21 R 4,546,932
107 4,546,933
4,546,934
170 4,546,935
198 4,546,936
219 4,546,937

CLASS 244

3.29 4,546,940
66 4,546,938
118.5 4,546,939

CLASS 248

174 4,546,941
187 4,546,942
205.3 4,546,943
219.2 4,546,944
346 4,546,945
346.1 4,546,946
442.2 4,546,947
454 4,546,948
514 4,546,949
610 4,546,950

CLASS 249

95 4,546,951
106 4,546,952

CLASS 250

201 4,547,662
4,547,663
205 4,547,664
227 4,547,665
4,547,666
231 P 4,547,668
231 SE 4,547,667
310 4,547,669
370 4,547,670
483.1 4,547,672
554 4,547,673
560 4,547,674
565 4,547,675
578 4,547,676
4,547,677

CLASS 251

58 4,546,953
88 4,546,954
129.15 4,546,955
149.6 4,546,956

CLASS 252

8.5 A 4,547,297
8.5 C 4,547,298
4,547,299
8.8 4,547,300
4,547,301
48.4 4,547,302
73 4,547,303
79.1 4,547,304
94 4,547,305
99 4,547,306
107 4,547,307
186.26 4,547,308
299.63 4,547,309
511 4,547,310
4,547,311
513 4,547,312
518 4,547,313
520 4,547,314
522 R 4,547,315
571 4,547,316
700 4,547,317

CLASS 260

400 4,547,318
409 4,547,319
453 P 4,547,322
465.4 4,547,323
502.4 R 4,547,324

CLASS 261

65 4,547,325
114 R 4,547,326

CLASS 264

16 4,547,327
45.9 4,547,328
118 4,547,329
261 4,547,330
333 4,547,331
339 4,547,332
532 4,547,333

CLASS 266

106 4,546,957

CLASS 267

47 4,546,958
64.15 4,546,959
136 4,546,960

CLASS 270

53 4,546,961
54 4,546,962

CLASS 271

35 4,546,963
250 4,546,964

CLASS 272

56.5 R 4,546,965
76 4,546,966
93 4,546,967
117 4,546,968
118 4,546,970
4,546,971
145 4,546,972

CLASS 273

1.5 R 4,546,973
55 B 4,546,974
65 R 4,546,975
72 R 4,546,976
73 A 4,546,977
146 4,546,978
153 S Re.32,004
4,546,979
218 4,546,980
260 4,546,981
298 4,546,982
348.1 4,546,983
404 4,546,984

CLASS 277

134 4,546,985
184 4,546,986
207 A 4,546,987

CLASS 279

123 4,546,988

CLASS 280

1.16 4,546,989
216 4,546,990
282 4,546,991
4,546,992
291 4,546,993
423 R 4,546,994
655 4,546,995
764.1 4,546,996
772 4,546,997
807 4,546,998
825 4,546,999

CLASS 281

23 4,547,000

CLASS 283

81 4,547,001
91 4,547,002

CLASS 285

27 4,547,003
31 4,547,004
58 4,547,005

CLASS 290

40 C 4,547,678

CLASS 292

37 4,547,006
84 4,547,007
341.15 4,547,008
346 4,547,009

CLASS 294

50.9 4,547,010
54.5 4,547,011
93 4,547,012

CLASS 296

1 S 4,547,013
100 4,547,014
181 4,546,969

CLASS 297

16 4,547,015
194 4,547,016
318 4,547,017
483 4,547,018

CLASS 299

4 4,547,019

CLASS 301

37 P 4,547,021

CLASS 303

6 C 4,547,022

CLASS 307

108 4,547,679
141 4,547,680
279 4,547,681
296 R 4,547,681
297 4,547,682
355 4,547,683
481 4,547,684
530 4,547,685
570 4,547,686

CLASS 308

6 C 4,547,023
4,547,024
4,547,025

CLASS 310

58 4,547,687
59 4,547,688
71 4,547,689
214 4,547,690
361 4,547,691

CLASS 312

201 4,547,026

CLASS 313

270 4,547,693
384 4,547,694
406 4,547,695
407 4,547,696
412 4,547,697
414 4,547,698
4 4,547,699
487 4,547,700
500 4,547,701
509 4,547,702
4,547,703

CLASS 315

71 4,547,704
219 4,547,705
226 4,547,706
368 4,547,707
371 4,547,708
378 4,547,709
403 4,547,710
408 4,547,711

CLASS 318

128 4,547,712
254 4,547,713
4,547,714
345 B 4,547,715
443 4,547,716
484 4,547,717
568 4,547,718
592 4,547,692
723 4,547,719
782 4,547,720

CLASS 323

355 4,547,721

CLASS 324

51 4,547,722
55 4,547,723
57 R 4,547,724
58 R 4,547,731
61 R 4,547,725
78 Z 4,547,726
79 D 4,547,727
95 4,547,728
96 4,547,729
137 4,547,730
166 4,547,732
211 4,547,542
338 4,547,733
395 4,547,734
450 4,547,735

CLASS 329

50 4,547,736
4,547,737
107 4,547,738
145 4,547,739

CLASS 330

2 4,547,740
149 4,547,741
4,547,742
254 4,547,743
261 4,547,744
286 4,547,745
298 4,547,746

CLASS 331

17 4,547,747
49 4,547,748
57 4,547,749
99 4,547,750

CLASS 332

16 R 4,547,751
31 T 4,547,752

CLASS 333

115 4,547,753
219 4,547,754
246 4,547,755

CLASS 335

152 4,547,756
296 4,547,757
302 4,547,758

CLASS 336

192 4,547,759

CLASS 337

323 4,547,760

CLASS 339

8 R 4,547,027
14 R 4,547,028
16 R 4,547,029
21 R 4,547,030
75 M 4,547,031
90 R 4,547,032
97 P 4,547,034
97 R 4,547,033
103 M 4,547,035
186 R 4,547,036

CLASS 340

331 4,547,761
347 AD 4,547,766
347 CC 4,547,763
347 DA 4,547,762
347 DD 4,547,764
4,547,765
500 4,547,767
620 4,547,768
626 4,547,769
636 4,547,770
683 4,547,771
686 4,547,772
765 4,547,773
854 4,547,774

CLASS 343

17.2 R 4,547,775
394 4,547,777
456 4,547,778
700 MS 4,547 779
741 4,547,776

CLASS 346

1.1 4,547,785
9 4,547,780
33 R 4,547,781
74.4 4,547,782
76 PH 4,547,783
4,547,784
140 R 4,547,786
160 4,547,787
208 4,547,788

CLASS 350

3.75 4,547,037
6.5 4,547,038
96.20 4,547,039
96.34 4,547,040
334 4,547,042
335 4,547,043
357 4,547,046
433 4,547,044
444 4,547,045
514 4,547,047
622 4,547,041

CLASS 351

137 4,547,048
159 4,547,049

CLASS 352

43 4,547,050
216 4,547,051

CLASS 354

152 4,547,052
187 4,547,053
268 4,547,054

401 4,547,055
412 4,547,056
415 4,547,057

CLASS 355

3 BE 4,547,059
3 R 4,547,060
3 SH 4,547,058
10 4,547,061
14 R 4,547,062
15 4,547,063
4,547,064
28 4,547,065
97 4,547,066

CLASS 356

239 4,547,067
244 4,547,068
4,547,069
339 4,547,070
344 4,547,071
350 4,547,072
371 4,547,073
405 4,547,074
440 4,547,075

CLASS 357

23.7 4,547,789
42 4,547,790
43 4,547,791
45 4,547,792
50 4,547,793
70 4,547,794
80 4,547,795

CLASS 358

13 4,54/,796
27 4,547,797
44 4,547,798
74 4,547,799
107 4,547,800
111 4,547,801
119 4,547,802
140 4,547,803
142 4,547,804
195.1 4,547,805
212 4,547,806
213 4,547,807
228 4,547,808
229 4,547,809
256 4,547,810
280 4,547,811
283 4,547,812
285 4,547,813
298 4,547,814
335 4,547,815

CLASS 360

19.1 4,547,816
29 4,547,817
46 4,547,818
65 4,547,819
69 Re.32,007
71 4,547,820
75 4,547,821
78 4,547,822
90 4,547,823
113 4,547,824

CLASS 361

22 4,547,825
25 4,547,826
55 4,547,827
86 4,547,828
104 4,547,830
127 4,547,831
306 4,547,829
307 4,547,832
386 4,547,833
4,547,834
399 4,547,835
400 4,547,836

CLASS 362

186 4,547,837
211 4,547,838
216 4,547,839
226 4,5e7,840
269 4,547,841

CLASS 363

35 4,547,842
67 4,547,843

CLASS 364

138 4,547,846
148 4,547,847
189 4,547,844
200 4,547,845
4,547,848
4,547,849
4,547,850
401 4,547,851
431.04 4,547,852
464 4,547,853
474 4,547,854
4,547,855
478 4,547,856
505 4,547,857
513 4,547,858
571 4,547,859
709 4,547,860
715 4,547,861
726 4,547,862
784 4,547,863
824 4,547,864

CLASS 365

12 4,547,865
173 4,547,866
189 4,547,867
203 4,547,868

CLASS 366

244 4,547,076

CLASS 367

149 4,547,869
155 4,547,870

CLASS 368

107 4,547,077

CLASS 369

44 4,547,871
45 4,547,872
65 4,547,873
139 4,547,874
275 4,547,875
4,547,876

CLASS 370

58 4,547,877
62 4,547,878
86 4,547,879
91 4,547,880

CLASS 371

38 4,547,882

CLASS 372

25 4,547,883
58 4,547,884
4,547,885
59 4,547,886

CLASS 374

42 4,547,078
116 4,547,079
135 4,547,080

CLASS 375

1 4,547,887
14 4,547,888
15 4,547,889
19 4,547,890

CLASS 376

389 4,547,334
442 4,547,335

CLASS 377

16 4,547,891

CLASS 378

8 4,547,892
19 4,547,893

CLASS 381

70 4,547,894

CLASS 382

4 4,547,898
7 4,547,896
4,547,899
8 4,547,895
4,547,897

CLASS 383

5 4,547,900

CLASS 384

107 4,547,081
278 4,547,082
535 4,547,083
576 4,547,084

CLASS 400

124 4,547,085
4,547,086
144.2 4,547,087
241.1 4,547,088
354 4,547,089

CLASS 401

235 4,547,090

CLASS 402

12 4,547,091

CLASS 403

59 4,547,092

CLASS 405

61 4,547,093
132 4,547,094
206 4,547,095
251 4,547,096
259 4,547,106
283 4,547,097
291 4,547,098

CLASS 406

149 4,547,099

CLASS 407

39 4,547,100

CLASS 408

127 4,547,101
141 4,547,105
185 4,547,102
197 4,547,103
220 4,547,104

CLASS 410

58 4,547,107

CLASS 411

374 4,547,108

CLASS 414

22 4,547,109
4,547,110
27 4,547,111
31 4,547,112
49 4,547,113
81 4,547,114
121 4,547,115
160 4,547,116
404 4,547,117
408 4,547,118
735 4,547,119
744 R 4,547,120
753 4,547,121

CLASS 415

9 4,547,122
24 4,547,123

CLASS 416

86 4,547,124
117 4,547,125
132 A 4,547,126
134 A 4,547,127

CLASS 417

2 4,547,128
48 4,547,129
53 4,547,130
4,547,131
63 4,547,132
270 4,547,133
349 4,547,134
360 4,547,135
475 4,547,136

CLASS 418

55 4,547,137
4,547,138

CLASS 419

31 4,547,336
49 4,547,337

CLASS 420

584 4,547,338

CLASS 422

26 4,547,339
116 4,547,340
147 4,547,341
166 4,547,342
304 4,547,343
310 4,547,344

CLASS 423

53 4,547,345
87 4,547,346
141 4,547,347
150 4,547,348
164 4,547,349
210 4,547,350
242 4,547,351
279 4,547,352
522 4,547,353
587 4,547,354
593 4,547,355
658 4,547,356

CLASS 424

5 4,547,357
14 4,547,358
22 4,547,359
45 4,547,360
49 4,547,361
4,547,362
61 4,547,363
70 4,547,364
71 4,547,365
78 4,547,366
89 4,547,367
4,547,368
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			061	4,547,583				314	4,547,602	621	4,547,615		270	4,547,192
250	4,547,578		075	4,547,585	33	4,547,592		375	4,547,603	640	4,547,616		282	4,547,193
264	Re.32,006		211	4,547,586	54	4,547,593		458	4,547,604	646	4,547,617		283	4,547,194
280	4,547,579				392	4,547,594		467	4,547,605	660	4,547,618		359	4,547,195
379	4,547,580			CLASS 562	454	4,547,595		477	4,547,606	824	4,547,619			
451	4,547,581				751	4,547,596		500	4,547,607	852	4,547,620			CLASS 623
	CLASS 556		494	4,547,587	779	4,547,597			4,547,608				1	4,546,499
			535	4,547,588	922	4,547,598			4,547,610		CLASS 604			4,546,500
14	4,547,321		572	4,547,589					4,547,611	4	4,547,186		23	4,546,501
83	4,547,320		575	4,547,590		CLASS 570		517	4,547,609	49	4,547,187			
					241	4,547,599		533	4,547,612	55	4,547,188			CLASS 799
	CLASS 560			CLASS 564					4,547,613	136	4,547,189			
						CLASS 585				185	4,547,190		86	4,547,020
71	4,547,584		479	4,547,591	259	4,547,600								

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D2—	232	280,945	D7—	38	280,960		396	280,974		62	280,988		143	281,002	D27—	12	281,016
	248	280,946		39	280,961	D9—	353	280,975		113	280,989		159	281,003	D28—	3	281,017
		280,947			280,962		456	280,976	D15—	5	280,990		171	281,004			281,018
		280,948			280,963	D10—	94	280,977		7	280,991		191	281,005		13	281,019
	310	280,949		79	280,964		114	280,978			280,992			281,006		18	281,020
	320	280,950		81	280,965	D11—	130	280,979		9	280,993		D23—	18	281,007		29	281,021
D3—	35	280,951			280,966	D12—	112	280,980	D16—	112	280,994			72	281,008		35	281,022
		280,952		339	280,967		142	280,981	D17—	7	280,995				281,009			281,023
	36	280,953		351	280,968		149	280,982	D21—	59	280,996			150	281,010		38	281,024
D4—	128	280,954		354	280,969		157	280,983			280,997		D24—	17	281,011		46	281,025
D6—	361	280,955	D8—	36	280,970	D14—	34	280,984		115	280,998			29	281,012	D30—	3	281,026
	381	280,956		76	280,971			280,985			280,999			40	281,013		16	281,027
	455	280,957		331	280,972		53	280,986		134	281,000			52	281,014		37	281,028
	517	280,958		395	280,973			280,987		136	281,001		D26—	110	281,015	D32—	9	281,029
		280,959															

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01 : 4,546,818	4,546,920	4,547,692	4,547,853	4,547,089	4,546,554
4,546,968	4,546,922	4,547,739	4,547,856	4,547,094	4,546,713
4,547,115	4,546,939	4,547,755	10 : 4,547,217	4,547,101	4,546,730
4,547,121	4,546,941	4,547,775	4,547,436	4,547,148	4,546,829
4,547,325	4,546,942	4,547,792	11 : 4,547,011	4,547,173	4,546,849
04 : 4,546,495	4,546,949	4,547,794	12 : 4,546,505	4,547,205	4,546,899
4,546,511	4,546,970	4,547,795	4,546,539	4,547,287	4,547,642
4,546,853	4,546,972	4,547,812	4,546,579	4,547,319	22 : 4,547,096
4,547,027	4,546,978	4,547,822	4,546,634	4,547,351	4,547,593
4,547,029	4,546,993	4,547,824	4,546,728	4,547,370	4,547,860
4,547,143	4,547,001	4,547,849	4,546,752	4,547,399	23 : 4,547,697
4,547,184	4,547,016	4,547,862	4,546,774	4,547,413	24 : 4,546,493
4,547,198	4,547,032	4,547,880	4,546,775	4,547,430	4,546,507
4,547,256	4,547,035	4,547,881	4,546,943	4,547,464	4,546,667
4,547,406	4,547,044	4,547,882	4,546,947	4,547,490	4,546,983
4,547,797	4,547,050	4,547,883	4,547,288	4,547,540	4,547,122
4,547,888	4,547,088	4,547,884	4,547,294	4,547,569	4,547,139
05 : 4,546,523	4,547,112	4,547,885	4,547,627	4,547,608	4,547,162
06 : 4,546,496	4,547,144	4,547,890	4,547,656	4,547,630	4,547,215
4,546,509	4,547,155	08 : 4,546,502	4,547,662	4,547,634	4,547,226
4,546,541	4,547,159	4,546,564	4,547,839	4,547,645	4,547,297
4,546,590	4,547,166	4,546,567	4,547,886	4,547,658	4,547,367
4,546,610	4,547,170	4,546,586	4,547,894	4,547,696	4,547,368
4,546,614	4,547,218	4,546,792	13 : 4,546,585	4,547,698	4,547,590
4,546,621	4,547,247	4,547,330	4,547,010	4,547,715	4,547,745
4,546,625	4,547,248	4,547,347	4,547,195	4,547,722	4,547,774
4,546,627	4,547,252	4,547,348	4,547,644	4,547,761	4,547,776
4,546,641	4,547,253	4,547,432	4,547,657	4,547,805	4,547,802
4,546,644	4,547,272	4,547,779	4,547,827	4,547,843	4,547,858
4,546,650	4,547,285	09 : 4,546,503	15 : 4,546,757	4,547,877	25 : 4,546,494
4,546,660	4,547,293	4,546,504	17 : 4,546,513	4,547,878	4,546,500
4,546,665	4,547,324	4,546,544	4,546,524	4,547,900	4,546,543
4,546,686	4,547,381	4,546,605	4,546,528	18 : 4,546,518	4,546,612
4,546,688	4,547,388	4,546,855	4,546,548	4,546,754	4,546,613
4,546,698	4,547,395	4,546,903	4,546,560	4,546,771	4,546,651
4,546,762	4,547,404	4,546,948	4,546,599	4,546,961	4,546,682
4,546,763	4,547,443	4,546,955	4,546,618	4,547,140	4,546,716
4,546,765	4,547,472	4,546,977	4,546,657	4,547,211	4,546,888
4,546,767	4,547,474	4,547,169	4,546,664	4,547,236	4,546,957
4,546,770	4,547,534	4,547,265	4,546,696	4,547,358	4,546,980
4,546,778	4,547,553	4,547,296	4,546,711	4,547,386	4,547,055
4,546,793	4,547,577	4,547,446	4,546,742	4,547,453	4,547,061
4,546,812	4,547,582	4,547,501	4,546,761	4,547,488	4,547,281
4,546,833	4,547,604	4,547,523	4,546,777	4,547,564	4,547,356
4,546,838	4,547,606	4,547,528	4,546,830	19 : 4,546,638	4,547,405
4,546,846	4,547,623	4,547,531	4,546,832	4,546,927	4,547,451
4,546,859	4,547,629	4,547,547	4,546,868	4,546,975	4,547,622
4,546,863	4,547,641	4,547,559	4,546,872	4,546,996	4,547,624
4,546,865	4,547,653	4,547,786	4,546,891	4,547,107	4,547,693
4,546,874	4,547,659	4,547,800	4,546,914	4,547,666	4,547,700
4,546,877	4,547,678	4,547,813	4,547,004	4,547,746	4,547,702
4,546,902	4,547,683	4,547,821	4,547,033	20 : 4,547,660	4,547,747
4,546,908	4,547,685	4,547,846	4,547,079	21 : 4,546,533	4,547,753

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